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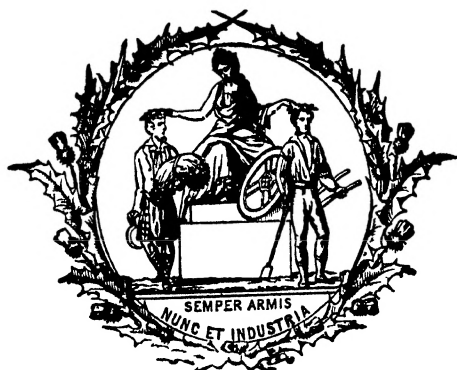
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WITH
AN ABSTRACT OF THE PROCEEDINGS AT BOARD AND GENERAL
MEETINGS, AND THE PREMIUMS OFFERED BY
THE SOCIETY IN 1930

PUBLISHED ANNUALLY



FIFTH SERIES
VOL XLII.

EDITED BY JOHN STIRTON, SECRETARY TO THE SOCIETY

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CONTENTS

	PAGE
1. A SOIL BALANCE SHEET FOR A ROTATION. RESULTS OBTAINED FROM THE CRAIBSTONE DRAIN GAUGES. By Professor JAMES HENDRICK, B.Sc., F.I.C.	1
2. THE INFLUENCE OF DIET ON SUSCEPTIBILITY TO DISEASE. By J. B. ORR, D.S.O., M.C., M.A., M.D., D.Sc.	28
3. CATTLE FEEDING. REPORT ON EXPERIMENTS COMPARING HEAVY ROOT, MEDIUM ROOT, AND NO ROOT RATIONS. By Principal WILLIAM G. R. PATERSON, B.Sc., N.D.A. (Hons.)	37
4. THE DENTITION OF THE PIG. By Principal O. CHARNOCK BRADLEY, M.D., D.Sc., M.R.C.V.S. (<i>Illustrated</i>)	51
5. CHEVIOT SHEEP: SOUTH AND NORTH COUNTRY. By JOHN ROBSON, Jun. (<i>Illustrated</i>)	63
6. THE WARBLE FLIES OF CATTLE. By R. STEWART MACDOUGALL, M.A., D.Sc., F.R.S.E. (<i>Illustrated</i>)	75
7. NOTES ON INTENSIVE CULTIVATION OF GRASSLAND. By WILLIAM LOW	113
8. COMMERCIAL PIG PRODUCTION IN SCOTLAND. LESSONS FROM THE SCOTTISH BACON PIG COMPETITIONS. By ALEX. CALDER, Ph.D., B.Sc.	118
9. POTATOES IN STOCK FEEDING. By J. K. THOMPSON, N.D.A.	128
10. MANURING OF CROPS IN DUMFRIES AND GALLOWAY. By JOHN GILLIES, N.D.A., N.D.D.	152
11. AGRICULTURAL RESEARCH IN SCOTLAND IN 1929. BEING A BRIEF SUMMARY OF WORK AT THE SCOTTISH AGRICULTURAL RESEARCH STATIONS DURING THE YEAR	169
12. MILK RECORDS. By WILLIAM STEVENSON, B.Sc., N.D.A., N.D.D.	187

13. ANALYSES FOR MEMBERS DURING 1929. By Dr J. F. TOCHER	211
14. THE CEREAL AND OTHER CROPS OF SCOTLAND FOR 1929.	217
15. THE WEATHER OF SCOTLAND IN 1929. By J. CRICHTON, M.A., B.Sc.	237
Rainfall Records for 1929 in inches	246
16. AGRICULTURAL STATISTICS	247
17. PRICES OF GRAIN IN EDINBURGH MARKET FOR 1929 .	261
18. PRICES OF SHEEP SINCE 1818	262
19. PRICES OF WOOL SINCE 1818	266
20. GENERAL SHOW AT ALLOA, 1929 (<i>Illustrated</i>) . .	269
21. PREMIUMS AWARDED BY THE SOCIETY IN 1929 . .	299
22. ABERDEEN SHOW, 1928, ALTERATIONS IN PRIZE LIST .	390
23. ACCOUNTS OF THE SOCIETY FOR 1928-29	392
24. PROCEEDINGS AT SOCIETY'S BOARD AND GENERAL MEETINGS	401

APPENDIX.

PREMIUMS OFFERED BY THE SOCIETY IN 1930	1
MEMBERS ADMITTED JUNE 1929 AND JANUARY 1930 . .	131

INDEX TO FIFTH SERIES OF THE SOCIETY'S TRANSACTIONS, VOLUMES XXXVI. TO XLII. (1924 TO 1930) . . .	<i>At end</i>
--	---------------

**.* It is to be distinctly understood that the Society is not responsible for the views, statements, or opinions of any of the Writers whose Papers are published in the 'Transactions.'*

ILLUSTRATIONS

FIG.	PAGE	FIG.	PAGE
1. Diagram of the unworn teeth of the pig	52	16. <i>Hypoderma bovis</i> × 2	81
2. Chart of the periods of eruption of the deciduous teeth of the pig	56	17. <i>Hypoderma lineatum</i> × 2	82
3. Chart of the periods of eruption of the permanent teeth of the pig	57	18. Egg of <i>Hypoderma bovis</i>	83
4. Chart to show the periods of eruption of the third incisor, canine, first premolar, and first molar in the Edinburgh specimens, as compared with the corresponding periods as stated by other observers	60	19. Eggs of <i>Hypoderma lineatum</i> attached to hair of cow	84
5. Two-shear Cheviot Ram (First, Highland and Agricultural Society Show, Kolso, 1832)	65	20. First-stage larvæ of <i>Hypoderma bovis</i>	84
6. First Prize pen of Cheviot Ewes in 1844	66	21. Hind spiracles of second-last-stage larva of <i>Hypoderma lineatum</i>	85
7. Two-shear Cheviot Ram (First and Champion, Caithness Show, 1925)	67	22. Hind spiracles of second-last-stage larva of <i>Hypoderma bovis</i>	85
8. Two-shear Cheviot Ram (First Prize, Caithness Show 1903)	68	23. Hind spiracles of second-last-stage larva of <i>Hypoderma lineatum</i> (larva full grown and about to moult)	86
9. Shearling Cheviot Ram, "Millknowe Sensation" (First and reserve Champion, Highland and Agricultural Society Show, Alloa)	69	24. Final-stage <i>Hypoderma bovis</i> larva	86
10. Cheviot Gimmer, "Lady Dean" (First and Champion, Highland and Agricultural Society Show, Aberdeen, 1928)	70	25. Final-stage <i>Hypoderma lineatum</i> larva, in the beginning of the instar	87
11. <i>Tabanus sudeticus</i>	77	26. Spiracles of last-stage larva of <i>Hypoderma lineatum</i>	87
12. Larva of <i>Tabanus biguttatus</i>	77	27. Spiracles of last-stage larva of <i>Hypoderma bovis</i>	88
13. Larvæ of Horse Bot attached to stomach	78	28. Puparium of <i>H. bovis</i> from which the adult fly has issued	89
14. Larva of <i>Gasterophilus intestinalis</i> (equi)	79	29. Puparium of <i>Hypoderma diana</i> × 2	89
15. <i>Hypoderma diana</i> × 2	81	30. Early stage larvæ of <i>Hypoderma lineatum</i> in gullet of ox	95
		31. Under side of hide of ox, showing warble cysts, each of which contains a larva of <i>Hypoderma lineatum</i>	96
		32. Under side of hide of deer, showing warbles, each of which contains the larva of <i>Hypoderma diana</i>	97

FIG.	PAGE	FIG.	PAGE
33. Piece of hide of ox, after tanning, showing the warble holes	101	47. Highland Pony Stallion, "Glenbernewdale" 891	289
34. Shorthorn Bull, "Bridgebank Vulcan" 221,490	283	48. Western Island Pony Stallion, "Bonnie Charlie of Farr" 1124	290
35. Aberdeen-Angus Cow, "Roseleaf of Ballindalloch" 74,176	283	49. Shetland Pony Stallion, "Duncan of Overacres" 1216	290
36. Galloway Cow, "Ewanston Aster" 28,529	284	50. Mare in Harness, "Eastertide" 26,108	291
37. Belted Galloway Heifer, "Gartmore Helen 1st" 1322 B	284	51. Blackface Tup, "Flockmaster"	292
38. Highland Bull, "Culnadalloch II. of Achnacloich" 3441	285	52. Cheviot Shearling Ewe	292
39. Ayrshire Cow, "Meikle Kilmory Pansy 2nd" 91,249	285	53. Border Leicester Shearling Ewe	293
40. British Friesian Heifer, "Drumry Butterfly" 115,434	286	54. Half-bred Ewe	293
41. Red Poll Bull, "Colton Erry" 14,468	286	55. Oxford-Down Shearling Tup	294
42. Clydesdale Stallion, "Craigie Winalot" 21,322	287	56. Suffolk Shearling Ewe	294
43. Clydesdale Gelding, "Dan"	287	57. Shropshire Shearling Tup	295
44. Clydesdale Mare, "Brunstane Phyllis"	288	58. Dorset Horn Ewe (451)	295
45. Shire Mare, "Lockingo Ridgeway Rose" 119, 877	288	59. British-Alpine Male Goat, "Dupplin Abbotspeed" 8692	296
46. Hunter Gelding, "Glenholmo"	289	60. Large White Sow, "Peakirk Mary 5th" 160,130	297
		61. Middle White Sow, "Ashton-hayes Monadelphia" 174,202	297
		62. Large Black Sow, "Baydon Nightingale 52nd" E 162	298

TRANSACTIONS
OF
THE HIGHLAND AND AGRICULTURAL
SOCIETY OF SCOTLAND

A SOIL BALANCE SHEET FOR A ROTATION.
RESULTS OBTAINED FROM THE CRAIBSTONE
DRAIN GAUGES.

By PROFESSOR JAMES HENDRICK, B.Sc., F.I.C., University of Aberdeen.

IN the 'Transactions' for 1921 an account was given of the construction of the drain gauges or lysimeters at the Experimental Farm of Craibstone, near Aberdeen, and of the tests which they underwent before use began to be made of them in 1919.¹ That paper also gives the analysis of the soil and subsoil of the drain gauges and the results obtained during 1919 and 1920, the first two years when records were kept of the drainage which flowed from the gauges and the substances which it removed from the soil. These were preliminary years before manuring and liming began, and were intended as a final test to see that everything was in order and that the drain gauges were working properly. After that manuring began, and the drain gauges were cropped in the ordinary six-course rotation of the district, the same as the surrounding field. This rotation is as follows: Turnips 1921, Oats 1922, Hay 1923, Grass 1924 and 1925, Oats 1926. It is on the results obtained during this rotation that the following account of the gains and losses of the soil is based.

A Correction of the 1921 Paper.—In the paper in the 'Transactions' in 1921 photographs of the drain gauges were given on pp. 66 and 67, and on p. 65 a diagram was given showing the depth at which the soil passes into the subsoil in each

¹ "The Measurement of Soil Drainage: with an account of the Craibstone Drain Gauges." 'Transactions,' 1921, pp. 56-79.

drain gauge. Unfortunately in this diagram a mistake was made, and the drain gauge numbered 1 should have been numbered 3, and *vice versa*. Drain gauge No. 1 has the shallowest soil and No. 3 has the deepest, while in the diagram No. 1 is wrongly shown as having the deepest soil and No. 3 as having the shallowest. This serious error escaped notice till after the paper was printed. This difference in depth of soil is not of merely academic interest, but has an important bearing on the results given by the drain gauges, as is well illustrated in the results given in the previous paper for 1919 and 1920. In both those years the crop grown was oats, and in both years No. 3, which has the deepest soil, gave a considerably better crop, both of grain and straw, than either of the other two drain gauges.

Plan of the Experiments.—The rain is measured by a standard Snowdon rain gauge placed alongside the drain gauges. The rain water is also collected and analysed to measure the amount of nitrogen and other substances brought down by the rain to the soil. Though rain water is nearly pure water, it contains a little ammonia and other nitrogenous substances of manurial value. It also contains small quantities of chlorides and sulphates, and all these are measured. The drain gauges themselves show the amount of water which percolates through the soil and subsoil. This drainage water is analysed, and the substances washed away from the soil by the drainage are thus determined. The analysis of the soil shows the store of substances contained in the soil itself, and all the manures, both dung and artificials, which are added to the drain gauges are analysed. Thus we know all that is added to the soil as manure. The crops grown on the drain gauges are all weighed and analysed, and thus we know all that is removed from the soil in crops. In this way these experiments enable us to make up a fairly complete balance sheet of all that has been added to the soil and all that has been removed from it during a rotation. Our balance sheet, as will be shown later, is not quite complete, however, for there are certain items which even the drain gauges do not enable us to put down accurately.

In order to obtain further information the three drain gauges are differently manured. No. 1 has been unmanured since the soil was originally enclosed in the lysimeter in 1914; No. 2 has been manured with both dung and artificials; while No. 3 has received the same weight of both dung and artificials as No. 2, and has been limed in addition. The manuring given during the rotation here dealt with was moderate, such as might be given by a man who was treating his land moderately well. It was at the following rate per acre to both drain gauges 2 and 3;—

1921. To the Turnip crop—dung, 12 tons; superphosphate, 6 cwt.
1922. To the Oat crop—sulphate of ammonia, 1 cwt.
1923. To the Hay crop—sulphate of ammonia, 1 cwt.

In January 1921 No. 3 received a dressing of ground lime at a rate equal to 2 tons per acre of carbonate of lime, and this dressing was repeated in November 1925 when the third-year grass was broken up.

Rainfall and Drainage.—The rain which falls upon the soil is mainly disposed of in two ways. Part of it is evaporated either directly from the surface of the soil or through the agency of plants which take it up and transpire it from their leaves, and the rest sinks gradually deeper into the soil and flows away in the drainage. Where the rainfall is low or the evaporation great there may be no excess to flow away as drainage. This is the case over large areas of the world with hotter or drier climates than ours. On the other hand, where rainfall is very heavy, part of the water may flow away over the surface of the soil without percolating through it, and in the process sweep away part of the soil itself and thus cause more or less serious denudation. In our country, however, rainfall is generally gentle, denudation is very limited, and in all parts of the country a large part of the rainfall percolates through the soil. At Craibstone the rain gauge measures the rainfall, while the drain gauges show the amount of the rain which percolates through soil and subsoil 40 inches deep. The difference between these shows the amount of the rain which has been evaporated into the atmosphere either directly from the soil or through the agency of plants.

Table I. gives a summary of these figures for the past eleven years, and shows that for the whole period of eleven years the average rainfall has been over $34\frac{1}{2}$ inches. It is probable that this has been an exceptionally wet period, as it has included several very wet years and only one specially dry one. During the period the average drainage has varied from about 18 to over 19 inches in the different drain gauges, and the average evaporation from about $15\frac{1}{2}$ to $16\frac{1}{2}$ inches. During the six-year rotation with which we are specially dealing, the average rainfall was a little over 34 inches, and the average drainage between 18 and 19 inches.

[TABLE I.

TABLE I.—RAINFALL AND DRAINAGE. IN INCHES.

Year.	Rainfall.	Drainage.		
		Lysimeter 1.	Lysimeter 2.	Lysimeter 3.
<i>Preliminary Period.</i>				
1919.	34.72	23.32	25.52	24.53
1920.	32.25	18.09	19.23	16.77
<i>First Rotation.</i>				
1921.	17.86	4.93	5.29	4.86
1922.	35.37	18.78	17.42	15.68
1923.	44.19	24.64	23.00	25.21
1924.	39.56	25.75	24.11	26.52
1925.	29.79	16.56	17.61	18.12
1926.	38.04	22.51	21.52	20.16
Average for rotation.	34.13	18.86	18.16	18.42
<i>Second Rotation.</i>				
1927.	39.08	21.57	19.73	16.64
1928.	33.75	17.54	15.78	13.75
1929.	36.71	18.22	18.77	16.60
Average for 11 years.	34.67	19.26	18.91	18.08
Average evaporation .		15.41	15.76	16.59

The drainage obtained from the different lysimeters varies somewhat from year to year ; thus it will be seen on reference to Table I. that lysimeter 2 gave the greatest amount of drainage in each of the first three years, but the smallest amount in each of the next three years. Similar differences from year to year will be found for all the drain gauges. One reason for these differences is that the drain gauges are not far from buildings and trees, and the ground in their neighbourhood is very uneven. The wind therefore blows unevenly in gusts and eddies across them, and distributes the rain unevenly upon them. That this is so is plainly shown in winter during snowfall, for the snow is rarely distributed uniformly over all three drain gauges. Sometimes one has the snow lying deeper upon it and sometimes another, depending

upon the direction of the wind. Another reason for differences between the three drain gauges lies in the differences in the crops grown upon them. No. 1 being unmanured yields the smallest crops, while Nos. 2 and 3 being manured yield larger crops, and, generally speaking, No. 3, which has the deepest soil and is both manured and limed, yields the largest crops of all. The greater the crop the greater is the amount of water which it passes through its system and transpires into the air again, so that the drain gauge which grows the biggest crops might be expected to evaporate most water. Taking the whole period of eleven years this is so, for there is less drainage and more evaporation from No. 3 than from No. 2, and less drainage and more evaporation from No. 2 than from No. 1.

In a dry year, as might be expected, there is less drainage than in a wet year. The only very dry year in the period was 1921, in which the rainfall was only 17.86 inches, or little more than half the average. In this year the drainage from the different drain gauges was only about 5 inches. On the other hand, 1923 and 1924 were both very wet years, and, as will be seen from the table, the drainage was very high in these years, and was on the average about five times as great as in the very dry year 1921.

The amount of drainage varies, as might be expected, very greatly with the time of year. Very little is obtained during the summer and autumn months, while, on the other hand, it is abundant during the winter, and begins to fall off in the spring as the days lengthen. In a normal season there are generally two or three months in the summer and early autumn in which there is no drainage at all, or very little. In the very dry year 1921 the drainage ceased to come through early in June, and did not begin to flow again until late in December. In spite of the fact that in November there were 2.32 inches of rainfall, no drainage came through any of the drain gauges in that month. The soil has a great capacity for soaking up water, and once it becomes well dried several inches of rain have to fall before it is sufficiently soaked again for drainage to flow. On the other hand, once the soil is saturated with water, as is often the case in winter when there is no growth and when evaporation is very low, it continues to yield drainage for many days or even weeks after rain has ceased. The amount of drainage given from day to day gradually falls off until it becomes only a slow drip when there has been no rainfall for several days.

Substances washed from Soil by Drainage.—Water, as it percolates through the soil, washes away soluble substances, some of which are only washed down from the upper layers of the soil and redeposited in the lower layers, while

others remain in solution in the water and are removed completely from the soil. The chief substances of manurial value which we have to consider are Nitrogen, Phosphoric Acid, Potash, and Lime, but many other substances such as Magnesia, Soda, Silica, Sulphuric Acid, and Hydrochloric Acid are also found in the drainage water, and all of those mentioned are determined in the analyses which are made of the drainage from the Craibstone lysimeters.

One of the main uses of such drainage experiments as those at Craibstone is to show the extent to which losses of valuable manurial substances take place through drainage. When there is heavy rainfall after soluble manures are applied to the soil farmers are often anxious lest their manure is washed away and lost. These experiments demonstrate how far such fears are justified, and, as will be shown later, they indicate that drainage losses take place only slowly and to a very limited extent under the conditions of practice.

Nitrogen.—One of the most important constituents of the soil is nitrogen, and the capacity of the soil to grow crops depends to a large extent on a sufficient supply of nitrogen in forms suitable for the use of plants. We apply nitrogen in fertilisers in three forms—as organic compounds, as ammonia compounds, and as nitrates. Organic compounds of nitrogen, such as are supplied by dung, are almost entirely insoluble, and even if soluble, are fixed and retained by the soil; ammonia, though easily soluble, is also fixed and retained by the soil; and therefore organic nitrogen and ammonia compounds are not washed away in the drainage. Organic nitrogen gradually passes into ammonia in the soil, and ammonia, in a healthy well aerated soil, rapidly passes into nitrate, and nitrate is not fixed by the soil, but is readily washed away into the drainage. Drainage water from manured and cultivated land therefore nearly always contains nitrates. Nitrates, however, are also readily taken up by crops, and it is only the portion which escapes absorption by the roots of plants which is washed away in the drainage. In the drainage collected from the Craibstone lysimeters nitrates are always present, while ammonia and organic nitrogen are not present in any appreciable amount.

Table II. gives in pounds per acre the amount of nitrogen washed through each of the drain gauges as nitrate in each of the eleven years 1919-1929 inclusive.

[TABLE II.

TABLE II.—NITROGEN IN THE DRAINAGE WATER.

Pounds per acre.

Year and Crop.	Lysimeter		
	1.	2.	3.
<i>Preliminary Period.</i>			
1919. Oats . . .	43.49	43.60	49.64
1920. Oats . . .	15.10	16.02	15.99
<i>First Rotation.</i>			
1921. Turnips . . .	7.35	7.35	10.81
1922. Oats with seeds . . .	18.18	16.22	21.58
1923. Hay . . .	6.04	5.69	6.22
1924. Pasture . . .	3.42	3.19	3.53
1925. Pasture . . .	2.39	2.53	2.57
1926. Oats . . .	3.02	2.89	2.73
Total for rotation . . .	40.40	37.87	47.44
Average for rotation . . .	6.73	6.31	7.91
<i>Second Rotation.</i>			
1927. Swedes . . .	12.77	10.81	8.13
1928. Barley . . .	12.20	12.80	11.90
1929. Hay . . .	5.74	8.93	9.90
Total for 11 years . . .	129.70	130.03	143.00
Average for 11 years . . .	11.79	11.82	13.00

A considerable amount of nitrogen in the form of nitrate was washed away from each of the drain gauges in 1919, the first year in which they were in use, but in no year since then has more than a fraction of that amount of nitrogen been washed away; in fact, in the whole of the six-course rotation, 1921 to 1926, less nitrogen was removed by the drainage from each of the drain gauges than in the single year 1919. There is a good reason for that. For some years before 1919 the soil on the drain gauges was not cropped. During these years the drain gauges were being tested and were allowed to remain fallow; no plants were grown upon them therefore to absorb the nitrate until the crop of 1919 had germinated and begun to grow. During the first few months of 1919, therefore, a large amount of nitrate was washed from the drain gauges. Such an amount has never been found in the drainage since then because the crop has taken it up, and the more completely the soil is kept covered with crop the less nitrate is found in the drainage water. When the crop

is grass the soil is continually covered both winter and summer with living vegetation, and therefore, as the table shows, less nitrate is washed into the drainage at that time than when the soil is growing a crop such as turnips or oats, which covers it for part of the season only. The weather also makes a difference, as we can see by comparing 1921, when the crop was turnips, with 1922, when it was oats. 1921 was, as stated above, a very dry year, and almost no drainage came through from June until the end of the year. The result was that though lysimeters 2 and 3 were manured in that year with both dung and artificials, little nitrogen was washed through because there was practically no drainage after the manures were applied. On the other hand, a considerable amount of nitrate was washed away during the early part of 1922, when there was no crop to take it up, and when there was a considerable amount of drainage.

In the case of a cereal crop which occupies the ground and takes up nitrate during the period from spring to autumn only, a certain amount of nitrate is washed away in the drainage in late autumn and winter. On the other hand, when the land is covered with grass, although growth is almost inactive in winter, it is found that very little nitrate is washed into the drainage no matter what the season of the year. Presumably, therefore, in our climate a grass crop is able to absorb most of the nitrate which is produced at all seasons of the year.

The table shows that on the average during the rotation with which we are dealing only 6 or 7 lb. of nitrogen per acre per annum was washed away. This is a very small amount, and shows that under ordinary conditions of cropping and manuring there is far less danger of loss of nitrate in the drainage than is commonly supposed. The amount lost per acre is usually stated at a much higher figure than has been found in these experiments. It is still more remarkable that no more nitrogen is washed away from No. 2 than from No. 1; in fact, the average amount of nitrate obtained from this drain gauge is a little less than that obtained from No. 1.

No. 2 was dressed with dung in 1921 at the rate of 12 tons per acre. This dung contained nitrogen equal to 148 lb. per acre, of which 131.7 lb. was organic nitrogen and 16.3 lb. ammoniacal nitrogen (see Table IV.). It also received in each of the years 1922 and 1923 sulphate of ammonia at the rate of 1 cwt. per acre, which is equal to 23.55 lb. of ammoniacal nitrogen in each of these years. The total nitrogen applied during the rotation to this drain gauge was therefore 195.1 lb., of which 63.4 lb. was ammoniacal nitrogen. The only conclusion we can draw is that none of this large amount of nitrogen applied as manure has been lost in the drainage, for no more nitrogen is lost from No. 2, which was manured, than

from No. 1, which was not manured. The nitrogen and other manures stimulated the growth of the crop, and no doubt caused it to produce deeper and more widely ranging roots. The result has been that not only has all the nitrogen applied as manure been taken up, but that in No. 2 a greater proportion of the nitrate derived from the soil's own resources has been taken up by the crop.

The case of No. 3 is slightly different. It has lost a little more nitrate than either No. 1 or No. 2, but it did that also during the preliminary period, and it has already been pointed out that it is a deeper and better soil than either No. 1 or No. 2. In any case the difference between the loss from this drain gauge and from the others is small. As in the case of No. 2, this drain gauge received 195.1 lb. of nitrogen in the manures which were applied to it during the rotation.

Phosphoric Acid.—Phosphoric acid is as important to the fertility of the soil as is nitrogen, but is far less subject to loss through drainage or otherwise. The drainage water of the Craibstone drain gauges is always tested for phosphoric acid, but no appreciable amount is ever found. This is in accordance with the results which have been obtained elsewhere. No soluble manurial substance which is added to the soil is more completely fixed than soluble phosphoric acid. In previous experiments¹ with Craibstone soil in shallow drainage tanks only 20 inches deep, on which no crops were grown, very heavy dressings of soluble phosphoric acid in the form of superphosphate were given, but though the heaviest dressings were at the rate of 2 tons of superphosphate per acre, no appreciable amount of phosphoric acid was washed away in the drainage. In these experiments also there were no crops to take up the phosphoric acid, and the depth of soil and subsoil was only 20 inches. It is not to be wondered at, therefore, that when superphosphate at the rate of 6 cwt. per acre, together with dung which contained 140 lb. of phosphoric acid per acre, was added to drain gauges 2 and 3, no appreciable amount of phosphoric acid was washed away in the drainage. We may safely conclude that under ordinary conditions of manuring such as prevail in practice, there is no danger of any phosphoric acid being lost in the drainage, no matter how heavy the rainfall.

Potash and Lime.—Potash and lime are the principal bases which are added to the soil in manures, though other bases such as soda, which is contained in nitrate of soda, and magnesia, which is contained in kainite and other potash

¹ "Drainage Investigations at Aberdeen." 'Scottish Journal of Agriculture,' vol. vii., 1924, pp. 8-18.

manures, are also added incidentally to a certain extent. Potash is added mainly to feed the plant, while lime is added mainly on account of its basic properties—that is, its power of combining with and neutralising acids—and only secondarily as a plant food. The parts played in the soil by potash and lime are very different, and, generally speaking, lime is freely washed away in the drainage, while the more valuable potash is removed to a small extent only.

The constitution of Craibstone soil, which is typical of the soils found over extensive areas in Scotland, has been dealt with elsewhere,¹ and we need not do more here than refer shortly to certain characteristics which have an important bearing on the question with which we are dealing. Craibstone soil is rich in potash, which is almost all contained in the form of insoluble compound silicates. It is so well supplied with potash that it was not considered necessary to supply any potash, beyond that contained in the dung, in the manures supplied during the rotation with which we are dealing. On the other hand, it contains no carbonate of lime, but is distinctly acid in reaction. It is not, however, without a supply of lime, but this, like the potash, is contained in compound silicates only comparatively slightly weathered. Along with the lime are other bases, soda and magnesia, which can and do to a certain extent take its place in the soil, and which, also are contained in the compound silicates, of which a large store exists in the soil. The soil itself has been derived mainly from granite which has been ground to powder, but the constituents of which are only superficially weathered.

In Table III. are given the potash and lime washed away in the drainage over a period of ten years. The figures for 1929 are not given in this case, as the analyses are not yet complete.

¹ "Studies of a Scottish Drift Soil. Composition of the Soil and of the Mineral Particles which compose it." By James Hendrick and W. G. Ogg. 'Jour. Agric. Sci.' vol. vii., pp. 458-469.

[TABLE III.

TABLE III.—POTASH AND LIME IN DRAINAGE WATER.
Pounds per acre.

	POTASH. Lysimeter			LIME. Lysimeter		
	1.	2.	3.	1.	2.	3.
<i>Preliminary Period.</i>						
1919 . . .	22.47	22.00	21.84	111.64	113.67	139.48
1920 . . .	16.88	17.29	14.79	79.02	79.79	84.32
<i>First Rotation.</i>						
1921 . . .	2.98	2.64	2.60	23.75	24.29	34.32
1922 . . .	14.78	13.88	11.39	88.02	138.49	172.53
1923 . . .	13.26	12.25	12.31	81.99	95.55	156.36
1924 . . .	11.26	9.70	9.81	81.98	75.82	98.67
1925 . . .	9.72	9.58	8.99	45.00	47.45	66.95
1926 . . .	11.35	11.36	10.27	97.04	89.24	139.69
Total for rotation .	63.35	59.41	55.37	417.78	470.84	668.52
Average for rotation	10.56	9.90	9.23	69.63	78.47	111.42
<i>Second Rotation.</i>						
1927 . . .	9.81	9.37	8.69	80.77	113.00	118.87
1928 . . .	8.01	8.97	6.95	77.79	115.30	132.92
Total for 10 years .	120.52	117.04	107.64	767.00	892.60	1144.11
Average for 10 years	12.05	11.70	10.76	76.70	89.26	114.41

The table shows that, as has been found elsewhere, the amount of lime washed from the soil in the drainage is many times as great as the amount of potash; but the contrast is not so great as has been found at Rothamsted and other places, for there is a greater proportion of potash in Craibstone drainage than is usually found, and a smaller amount of lime.

The total potash washed away during the rotation of six years, on the average of the three drain gauges, is about 60 lb. per acre, or about as much as would be contained in 4 cwt. of kainite, or in 2 cwt. of 30 per cent potash manure salt. It averages about 10 lb. of potash per acre per annum, a much greater amount than has been found in the drainage at Rothamsted or in other places. It is only a very small amount, however, compared with the great store of potash contained in this soil. Such a loss could continue for hundreds of years without exhausting the supply of potash in Craibstone soil.

The losses from drain gauges 1 and 2 are somewhat similar both for the six-year rotation and for the period of ten years.

On the other hand, No. 3 loses distinctly less potash than either 1 or 2. As the loss was less in the preliminary years, as well as after manures and lime were added, it must have been due to the soil rather than to the treatment. Where lime is added to the soil we might naturally expect that it would take the place of potash and cause less potash to be washed from the soil. This cannot, however, be the sole explanation in the case of these drain gauges.

When we turn to lime we find that drain gauges 1 and 2 lost very similar amounts during the preliminary period, but that during the rotation when manures were applied No. 2 lost considerably more than No. 1. During the second rotation a heavier dressing of manures is being given than during the first rotation, and already there are indications that the difference is being accentuated. The loss of lime from the soil depends to a large extent upon the manuring, and the more heavily a soil is manured with such fertilisers as sulphate of ammonia, muriate of potash, and superphosphate, the greater will be the amount of lime washed away in the drainage.

When sulphate of ammonia is applied to the soil the ammonia is fixed by the soil and subsequently changed by nitrification into nitric acid, but the sulphuric acid is washed away in the drainage, combined with lime and other bases obtained from the soil. Similarly with muriate of potash, the potash is fixed and retained by the soil, but the muriate or chloride is washed away in the drainage, mainly as the lime salt, calcium chloride. The nitric acid formed from sulphate of ammonia, or other nitrogen compounds in the soil, also combines with lime, and if not taken up by plants is washed into the drainage as nitrate of lime. The lime washed away in the drainage is not washed away as free lime, but combined with acids such as sulphuric, hydrochloric, and nitric acid, which are derived from the manures added or from the natural decomposition of the materials of the soil. The more heavily, therefore, the soil is manured, especially with sulphate of ammonia and with organic manures like dung, the greater may we expect the loss of lime in the drainage to be.

The case of No. 3 is somewhat different. This drain gauge yielded more lime in the drainage water in the preliminary years than either No. 1 or No. 2. This is due to difference in soil, but it was accentuated after 1921, as a dressing of ground lime equal to 2 tons of carbonate of lime per acre was given in that year and again in 1925. The addition of this lime causes, for reasons given below, a greater amount of lime, but a smaller amount of potash, to be washed from this drain gauge than from the others.

Though the amount of lime found in the Craibstone drainage

water is considerable, it is small in comparison with what has been found in drainage at Rothamsted and elsewhere. Generally speaking, it has been found that the drainage in climates with a similar rainfall to ours washes away from soil which is moderately well manured some 300 or 400 lb. of lime per acre per annum. In soil at Rothamsted, heavily manured with sulphate of ammonia, the amount lost is much greater than this. In such soils lime is almost the only base available to neutralise acids in the soil. It is otherwise in soils such as that of Craibstone, which contain large amounts of magnesia, soda, and potash combined, like the lime, with silica. In Craibstone drainage we find far greater amounts of soda and magnesia in the drainage than are found at Rothamsted or at other centres where similar data are recorded. In these Craibstone drain gauges we find that in the absence of manuring as great a weight of soda per acre per annum as of lime is washed away, and that in addition there is a weight of magnesia equal to from a half to a third of that of the lime. These substances play the same part as lime, and when, as at Craibstone and many other places in Scotland, they are present in large amount in the soil they replace lime. If we calculate the soda and magnesia in the Craibstone drainage into their equivalent of lime, we find that there, as at other places, the drainage is washing away bases at a rate equal to a few hundred pounds of lime per acre per annum.

In the case of No. 3 a considerable dressing of lime has been added to the soil. This increases the supply of available lime without increasing the other bases, and therefore, as has been found, a greater proportion of lime is washed away in the drainage.

Manures Added During Rotation.—The next table, IV., shows the manures applied to the drain gauges during the rotation 1921 to 1926. No manures were applied to No. 1, and the intention was to give No. 2 a moderate manuring such as might be given by any ordinary farmer. To the turnip crop was applied dung at the rate of 12 tons per acre, and superphosphate at the rate of 6 cwt. per acre. The following crop of oats received sulphate of ammonia at the rate of 1 cwt. per acre, as did the hay crop which followed the oats. Nothing further was given during the remaining three years of the rotation. No. 3 received an exactly similar manuring, and in addition received ground lime in such amount as to supply the equivalent of 2 tons of carbonate of lime per acre. It has been calculated that 2 tons of carbonate of lime per acre is sufficient to supply all the base required during a six-year rotation by arable land which is moderately well treated. A further dressing of ground lime at the same rate per acre

was given to No. 3 in the winter of 1925, when the land was broken out of lea.

Farmyard manure is an all-round manure, and Table IV. shows the amounts in pounds per acre of organic and ammoniacal nitrogen and of phosphoric acid, potash, and lime supplied by the 12-ton dressing of the farmyard manure used in the experiment. Superphosphate contains not only phosphoric acid but also lime, part of which is combined with the phosphoric acid, and a larger part with sulphuric acid. The table shows the pounds per acre of phosphoric acid and lime supplied by the actual sample of superphosphate used in the experiment. Similarly it gives the nitrogen supplied by the sulphate of ammonia used. It will be seen from the table that the dung used supplied the greater part of the nitrogen and phosphoric acid as well as all the potash applied during the rotation.

Weights of Crops yielded by the Drain Gauges.—Generally speaking, the crops grown upon the drain gauges were heavy. Even the continuously unmanured soil on No. 1 has yielded heavy crops of cereals and hay. The weights of the crops, calculated per acre, are given in Tables V. and VI. Table V. gives the weights of the crops as they were when removed from the soil. The crops were then taken to the laboratory and dried; and Table VI. gives the weights per acre of the completely dry material. Certain of the crops, such as turnips or grass, when harvested contain a large amount of water, and therefore the weights given in Table V. in these cases are very much greater than those given in Table VI.; in the case of cereals the grain and straw when harvested are already getting dry and the loss on drying is therefore much smaller.

As the crops produced by the unmanured soil are already substantial, such manuring as has been given during the first rotation on Nos. 2 and 3 has not produced in most cases very striking increases, especially when we bear in mind that No. 3, on account of its deeper soil, naturally gives greater crops than Nos. 1 and 2. In 1922 the unmanured drain gauge gave a heavy crop of oats, nearly 17 cwt. of grain, or about 5½ quarters, per acre, and in the succeeding year the first cut of hay weighed over 11 tons green and yielded over 57 cwt. dry matter per acre, which would be equal to well over 3 tons of ordinary hay; and the second cut weighed nearly 3 tons of green, or over 12 cwt. of dry material. The grass and clover seeds sown out with the oats in 1922 grew vigorously in that year. When the crop was harvested the green stuff, grass and clover, was separated from the corn and weighed by itself. The weight of this "grass" is shown separately in Tables V. and VI., and it will be noticed that No. 3, which yielded the very heavy crop of 29½ cwt., nearly

TABLE IV.—MANURES APPLIED DURING ROTATION, 1921-1926.

	Quantity per Acre.	Year Applied.	Crop.	Pounds per Acre.				
				Nitrogen.		Phosphoric Acid P_2O_5 .	Potash K_2O .	Lime CaO .
				Organic.	Ammoniacal.			
Ground Lime . .	4750 lb.	24/1/1921	Turnips					2787.25
Farmyard Manure . .	12 tons	19/5/1921	Turnips	131.72	16.31	139.77	185.47	131.71
Superphosphate . .	6 cwt.	19/5/1921	Turnips			120.51		176.19
Sulphate of Ammonia . .	1 cwt.	11/4/1922	Oats		23.55			
Sulphate of Ammonia . .	1 cwt.	30/4/1923	Hay		23.55			
Ground Lime . .	3410 lb.	21/11/1925	After Lea					2669.40
Total				131.72	63.41	260.28	185.47	5764.55

10 quarters of oats, and a correspondingly heavy crop of 60 cwt. of straw, yielded a far smaller weight of grass than either No. 1 or No. 2. This was because the very heavy crop of oats smothered the grass, and diminished very seriously the proportion of clover contained in it. Even on No. 2, where the crop was not so heavy, though considerably heavier than that on No. 1, the same effect was shown, though to a lesser extent. This introduces a complication of a serious kind into our experiment. In the two years 1924 and 1925 the crop was 'pasture.' Of course, small areas like the drain gauges could not actually be pastured by stock, nor could we have measured the amount of crop yielded in that way. The method adopted was to cut the grass at intervals of a few weeks so as to imitate roughly its removal by pasturing animals. In that way the crop was obtained and weighed green and dry, as shown in the tables, but it was found that the crop obtained from No. 3, while it weighed well, contained little clover, while No. 2 contained less clover than No. 1, and in third year's grass, 1925, also yielded a smaller weight of crop. The effect of this is still further shown in 1926 on the lea oat crop. The unmanured drain gauge No. 1 yielded the heavy crop of over 43 cwt., or $14\frac{1}{2}$ quarters of grain per acre; No. 2, and even No. 3, yielded smaller crops. This is no doubt due to the rich growth of clover on No. 1 during the preceding three years enriching this soil in nitrogen. This matter will be brought out further when we consider the nitrogen removed by the crops, which is given in Table VII.

No doubt this enrichment of the soil of the unmanured plot by the strong growth of clover is producing an effect on the second rotation, and helps to account for the excellent crop of barley grown on No. 1 in 1928, though this was the tenth crop grown on this soil without manure of any kind. It has already been stated that during the second rotation heavier manuring with artificials is being given to Nos. 2 and 3, and the barley crop on Nos. 2 and 3 was much heavier than the unmanured crop. Seeds of grass and clover were sown with this barley crop, and were almost a complete failure on No. 3 and a partial failure on No. 2. Seeds did not grow nearly so vigorously in 1928 as in 1922, and while a fair plant of grass and clover was left on No. 1, there was very little clover on No. 2 and the grass was weak, while on No. 3 there was practically no clover and little grass. Even though these two plots were resown with grass and clover seeds after the barley was removed, the hay crop obtained in 1929 was considerably lighter, and was much poorer in clover on Nos. 2 and 3 than on No. 1. It is probable that No. 1 will have been more enriched in nitrogen through the good growth of clover than Nos. 2 and 3 have been through the application of 1 cwt. of sulphate of ammonia per acre which was given to the hay crop on them,

TABLE V.—WEIGHTS OF CROPS GROWN ON THE LYSIMETERS.
As Cut—per Acre.

	Lysimeter 1.		Lysimeter 2.		Lysimeter 3.	
	Cwt.	lb.	Cwt.	lb.	Cwt.	lb.
<i>Preliminary Period.</i>						
1919. Oats—Grain .	20	20	21	77	22	12
Straw .	23	78	22	15	31	55
1920. Oats—Grain .	8	12	8	30	10	26
Straw .	19	43	18	100	28	105
<i>First Rotation.</i>						
1921. Turnips—Bulbs .	287	0	320	0	392	0
Shaws .	50	0	44	0	65	0
1922. Oats with seeds—Grain .	16	104	17	91	29	50
Straw .	25	69	48	39	60	79
Grass, &c. .	21	67	21	94	11	21
1923. Hay—First cut .	223	24	250	0	276	88
Second cut .	59	49	104	36	90	59
1924. Pasture .	100	2	101	83	136	85
1925. Pasture .	161	46	149	23	216	59
1926. Oats—Grain .	43	34	35	92	39	63
Straw .	32	53	29	103	40	39
<i>Second Rotation.</i>						
1927. Swedes—Bulbs .	221	0	289	0	394	0
Shaws, &c. .	82	0	101	0	153	0
1928. Barley—Grain .	25	27	36	34	40	41
Straw .	29	30	44	53	69	82
1929. Hay—First cut .	148	50	111	26	121	9
Second cut .	88	65	58	74	50	66

TABLE VI.—WEIGHTS OF CROPS GROWN ON THE LYSIMETERS.
Dry matter—per acre.

	Lysimeter 1.		Lysimeter 2.		Lysimeter 3.	
	Cwt.	lb.	Cwt.	lb.	Cwt.	lb.
<i>Preliminary Period.</i>						
1919. Oats—Grain . . .	17	94	18	90	19	78
Straw	20	98	19	17	28	0
1920. Oats—Grain . . .	7	29	7	51	9	28
Straw	17	22	16	89	25	84
<i>First Rotation.</i>						
1921. Turnips—Bulbs . . .	42	26	42	16	50	0
Shaws	9	62	7	106	10	90
1922. Oats with seeds—Grain . . .	14	111	15	74	28	0
Straw	21	43	37	48	50	82
Grass, &c.	4	96	5	12	3	19
1923. Hay—First cut . . .	57	75	65	74	72	48
Second cut	12	1	20	30	17	84
1924. Pasture	22	78	23	3	30	69
1925. Pasture	40	28	36	9	50	88
1926. Oats—Grain . . .	39	76	33	25	36	38
Straw	30	45	27	73	37	104
<i>Second Rotation.</i>						
1927. Swedes, Bulbs . . .	29	26	41	40	56	97
1928. Barley—Grain . . .	22	0	33	20	37	56
Straw	23	30	35	103	61	55
1929. Hay—First cut . . .	39	38	34	55	36	36
Second cut	21	95	14	107	13	0

Substances contained in the Crops.—The crops removed from the drain gauges were analysed, and the nitrogen, phosphoric acid, potash, lime, and other constituents contained in them were determined. Table VII. gives in pounds per acre the amount of the four chief constituents removed by each crop from each drain gauge. If we compare the figures given here with those given in Tables II. and III., it will be seen at once that far more nitrogen, phosphoric acid, and potash are removed in the crops than are lost in the drainage. In the case of nitrogen, in each drain gauge the loss in the drainage is trifling compared with the nitrogen removed in crops. The contrast is even more marked in the case of phosphoric acid, for nothing is lost in the drainage, but crops remove a substantial quantity each year. These results further emphasise what has been mentioned already—namely, that there is little danger of loss of soluble manures in the drainage where land is manured and cropped under ordinary practical conditions.

When we turn to the case of lime the result is somewhat different; far more is washed away in the drainage than is removed by crops. Generally speaking, crops do not take up much lime from the soil. The only crop in Table VII. which removed much lime was the hay in 1923. This is because red clover is comparatively rich in lime. On the other hand, for reasons which have been already discussed, a large amount of lime is usually washed away in the drainage. On most soils the amount of lime washed away would have been much greater than has been found in the case of Craibstone soil, for this soil, as has been mentioned above, contains large stores of other bases such as soda and magnesia, which are washed away in the drainage in the same way as lime. If we calculate the soda and magnesia found in the drainage into their equivalent of lime, we find that the amount of these bases washed away from No. 1 was equivalent to 529 lb. of lime during the first rotation, from No. 2 to 568 lb. of lime, and from No. 3 to 625 lb. of lime. In the cases of No. 1 and No. 2 these are quantities greater than the amount of lime actually found in the drainage, and in the case of No. 3 nearly equal to it. Under the conditions which prevail on the soil of Rothamsted, and other soils concerning which we have any experimental evidence, little soda and magnesia, but a greatly increased amount of lime, would have been washed away in the drainage.

The amount of nitrogen removed by the crops calls for some remark. It will be noted that it was especially great in 1923 and 1925 when the land was under grass. In 1923 more nitrogen was found in the crop of hay removed from No. 2 than was applied, both as dung and sulphate of ammonia, during the whole rotation. It will also be noted that, although

TABLE VII.—CONSTITUENTS REMOVED BY THE CROPS FROM THE LYSIMETERS.
Pounds per Acre.

Lysimeter.	Nitrogen.			Phosphoric Acid.			Potash.			Lime.		
	1.	2.	3.	1.	2.	3.	1.	2.	3.	1.	2.	3.
<i>Preliminary Period.</i>												
1919. Oats .	45.63	44.26	51.32	19.96	24.71	28.37	38.73	38.25	54.52	14.97	14.37	19.36
1920. Oats .	26.03	26.15	35.87	9.93	11.20	15.47	27.39	27.74	42.24	10.17	10.87	15.74
<i>First Rotation.</i>												
1921. Turnips—												
Bulbs .	53.92	44.79	68.93	37.85	37.27	43.72	82.32	92.45	108.70	32.64	29.72	35.29
Shaws .	27.64	24.51	36.17	11.72	10.34	15.74	38.62	36.77	42.24	22.84	17.28	17.66
1922. Oats .	46.05	52.25	65.36	23.53	31.13	40.54	39.04	68.57	79.84	28.01	29.27	32.49
1923. Hay .	139.90	200.39	177.69	42.03	56.38	66.86	115.06	157.81	153.96	205.48	205.85	186.42
1924. Grass .	64.58	64.97	88.98	25.55	26.58	34.99	72.91	75.33	101.84	20.01	19.68	34.39
1925. Grass .	114.33	104.68	147.55	34.50	32.81	45.04	111.95	98.67	128.25	44.51	33.54	62.87
1926. Oats .	78.32	67.88	80.97	38.32	37.93	44.97	61.24	53.96	70.63	16.24	11.85	19.73
Total for Rotation .	524.74	559.47	665.65	213.50	232.44	291.86	521.14	583.56	685.46	369.73	347.19	388.85
<i>Second Rotation.</i>												
1927. Swedes—												
Bulbs .	41.91	54.65	85.71	28.81	40.30	51.92	55.00	75.97	105.73	20.94	27.77	38.16
1928. Barley .	48.52	79.23	131.35	21.44	41.88	52.06	37.80	77.22	105.68	7.14	11.81	21.24

in this year the crop obtained from No. 3 weighed more than the crop from No. 2, more nitrogen was contained in the crop from No. 2. This is explained by the fact that No. 2 contained more clover than No. 3. The clovers and grasses from each drain gauge were separated and weighed separately, and it was found that clovers formed 65.6 per cent of the dry weight in the case of No. 2, and only 49.5 per cent in the case of No. 3.

Similarly in 1925 No. 1 gave more nitrogen than No. 2, partly because it yielded a slightly greater crop, but also because the crop contained a greater proportion of clover. The effect of this on the subsequent oat crop has already been referred to. The presence of greater or smaller proportions of clover in the crops has also a considerable effect on the lime and potash found in them.

Ammonia brought down by Rain.—It is well known that rain-water brings down to the soil a small dressing of nitrogen. In the neighbourhood of populous places this is chiefly in the form of ammonia, derived mainly from coal burnt in houses, factories, &c., though rain-water also contains a very small amount of nitrate and a little organic nitrogen. As Craibstone is situated only five miles from Aberdeen, which lies south-east of it, and as there are several houses and a laundry furnace within 100 yards of the drain gauges, determinations of the amount of ammonia brought down in the rain were made from the beginning of 1922 onwards. The amount in pounds per acre is shown in Table VIII.

TABLE VIII.—AMMONIACAL NITROGEN IN THE RAIN-WATER.

Pounds Nitrogen per Acre.

Year.	lb.
1922	4.72
1923	3.04
1924	3.84
1925	2.88
1926	4.11
<hr/>	
Total, 1922-1926	18.59
Average	3.72
<hr/>	
1927	3.26
1928	3.85
1929	5.20
<hr/>	
Total, 1922-1929	30.90
Average	3.86

The amount of ammonia contributed in this way is small, and would be distributed equally on all three drain gauges. At the rate shown it would be equal to slightly less than 1 cwt. of sulphate of ammonia per acre in the course of six years. The amounts of nitrate and of organic nitrogen in the rain were not determined. These, judging by determinations made at other places, would be very small, and, taken together, would probably be less than the nitrogen brought down as ammonia.

Summary of Additions to and Removals from the Soil.—We are now in a position to summarise the additions of nitrogen, phosphoric acid, potash, and lime to the soil and the removals of them from the soil. So far as phosphoric acid, potash, and lime are concerned there is no complication. They are not brought down by the rain in any appreciable amount, and the only additions to the soil are those made in dung and other fertilisers. All of them are taken up by crops and removed when the crops are harvested, and potash and lime are also washed away in the drainage, but we know of no other means by which they are lost in any appreciable quantity from the soil. So far as these are concerned, therefore, we are able to present a complete balance sheet. We know all that has been added and all that has been removed from the soil.

The case is very different with nitrogen. We know the amount we have added in manures, but nitrogen is fixed in the soil through the action of micro-organisms, and we have no means of telling how much this amounts to, though we know that it may be a very large amount. Further, in addition to nitrogen which is removed by crops and that which is washed away in the drainage, there may also be loss of nitrogen through the decomposition of nitrogen compounds in the soil, and the consequent escape either of free nitrogen gas or of gaseous compounds of nitrogen. Though there is reason to believe that such a loss of nitrogen sometimes takes place from the soil we know little about it, and have at present no means of estimating it. On both sides of the account, therefore, there are uncertainties in the case of nitrogen; on the credit side we know there are large gains, but we have not been able to ascertain their amount, and on the debit side we suspect that there may be certain unascertained sources of leakage.

The amount of nitrogen contained in the crops removed from drain gauge No. 1 during the rotation was over 524 lb. per acre, but reference to Table VII. will show that most of this, nearly 350 lb., was contained in the hay and grass crops which contained clover. Our analyses showed that most of this nitrogen was actually contained in the clover of these crops. This nitrogen was probably obtained from the

air through the micro-organisms in the nodules of the clover roots. In addition to this nitrogen which was removed in the crop, the clovers probably also enriched the soil in nitrogen derived from the air through the aid of the symbiotic micro-organisms in their root nodules, for, as we found already, the succeeding oat crop on this unmanured plot was very heavy, and contained a larger amount of nitrogen than the crop grown on No. 2.

There is another source from which the soil may obtain nitrogen, for we know that certain micro-organisms which live in the soil, in addition to those which live in the root nodules of leguminous plants, fix free nitrogen from the air when they are supplied with suitable organic food. The digging in of the sod of grass on all three drain gauges in 1925 would supply such organisms with food, and would probably lead to the fixation of an unknown amount of nitrogen in each case. We do not know, therefore, from the evidence before us, whether the balance is favourable or the reverse in the case of nitrogen either in the case of the continuously unmanured drain gauge No. 1 or in the manured drain gauges 2 and 3. In the case of Nos. 2 and 3 we know that crops removed far more nitrogen than was added in manures, and that more was lost in the drainage than was supplied by the rainfall, but we do not know what was the gain or loss through the action of micro-organisms. If such gain or loss has taken place, we may be able to ascertain it, after a few rotations have passed, by analysing the soil again, and finding whether it is gaining or losing nitrogen. The soil was analysed before the experiments started, and was then found to be well supplied with nitrogen. For instance, the surface 9 inches of No. 1 contained 0.227 per cent of nitrogen; this would correspond to about 4000 lb. of nitrogen per acre in the surface soil 9 inches deep. It will require a large gain or loss of nitrogen to be distinctly determinable by the analysis of the soil, and therefore we must wait till the experiments have lasted for a considerable period before we can make such analyses with any hope of success.

In the case of phosphoric acid nothing is lost in the drainage, and nothing is gained from the rain or the atmosphere or through the action of micro-organisms. Table IX. shows that in the manured drain gauges we were adding just about as much phosphoric acid in manures as we were removing in crops. On No. 2 the balance was a little in favour of the manure, and on No. 3 a little against it. We see, then, that even such a moderate manuring as 12 tons of dung and 6 cwt. of superphosphate in the course of a rotation is sufficient to balance all the phosphoric acid removed even by such heavy crops as were grown on these drain gauges. The results from

TABLE IX.—CONSTITUENTS ADDED TO AND REMOVED FROM THE SOIL DURING A ROTATION, 1921-1926.
Pounds per Acre.

	Nitrogen.			Phosphoric Acid.			Potash.			Lime.		
	1.	2.	3.	1.	2.	3.	1.	2.	3.	1.	2.	3.
Lysimeter.												
Added in manures .	0	195.13	195.13	0	260.28	260.28	0	185.47	185.47	0	307.90	5764.55
Brought down by rain	18.59	18.59	18.59	0	0	0	0	0	0	0	0	0
Total . .	18.59	213.72	213.72	0	260.28	260.28	0	185.47	185.47	0	307.90	5764.55
Removed by crops .	524.74	559.47	665.85	213.50	232.44	291.86	521.14	583.56	685.46	369.73	347.19	388.85
Removed by drainage	40.40	37.87	47.44	0	0	0	63.35	59.41	55.37	417.78	470.84	668.52
Total . .	565.14	597.34	713.09	213.50	232.44	291.86	584.49	642.97	740.83	787.51	818.03	1057.37

No. 1 show that this soil, which is naturally well supplied with phosphoric acid, is capable of supplying most of the phosphoric acid required for very heavy crops from its own resources. These resources will no doubt gradually become exhausted, but so great is the stock with which we start that even at the rate of 213 lb. per rotation it will require a large number of rotations before the soil will become seriously impoverished.

When we turn to potash the results are even more striking. Far more potash was removed in the crops from the manured plots than was supplied in manure. It has been pointed out already that no potash manures were used, and that all the potash given to Nos. 2 and 3 was supplied by the dung. More than three times as much was removed in crops as was supplied in this way, and, in addition, a considerable quantity was lost in the drainage. Even in the case of the unmanured plot the loss in crops and drainage was not far short of that from No. 2. The reason for this is that in this granitic soil the stores of potash, both in the soil and in the subsoil, are so great as to be practically inexhaustible. Most of this potash is so insoluble as to be unavailable to plants, but the natural processes of weathering are always rendering sufficient available to supply the ordinary requirements of crops, and it is probable that this process can continue almost indefinitely.

The position of this soil with regard to lime is very interesting, especially in view of the fact that there are a great many soils of similar type in Scotland. It is a light soil of open texture, yet, unlike typical light soils, it contains large stores of phosphoric acid and potash, and it also contains a large store of lime, and other bases which can replace lime, though it is free from carbonate of lime and is somewhat acid in reaction. Most light soils suffer from deficiency of potash, and also, when they are not naturally supplied with carbonate of lime, require to be limed from time to time in order to maintain the supply of available basic material; but here we have a type of light free working soil which has practically unlimited supplies of potash, and which does not show any serious lime deficiency even when unlimed for a long period. The explanation of these valuable properties is found in the constitution of the soil. Mechanical analysis shows that this soil contains about 70 per cent of sand, partly coarse sand and partly fine sand, but, unlike most sandy soils, this 'sand' is to a large extent made up not of particles of quartz, but of small particles of felspars and other compound silicates which contain the bases lime, magnesia, potash, and soda in combination with silica, iron, and alumina. Quartz itself supplies neither lime nor other bases, but these fine particles of compound silicates slowly decompose with the

gradual weathering of the soil materials and continuously yield small supplies of potash, lime, and other bases in forms which are available for use in the soil. Though in the main these bases are present in the sandy matter of the soil in very insoluble forms, still the store of them in the soil is very great, and the small amount which becomes available from year to year is sufficient to supply crops with potash, and also supplies sufficient lime, magnesia, and soda to combine with acids in the soil and to prevent the soil showing any extreme lime hunger even when unlimed for long periods. No lime was added to drain gauge No. 1, yet the resources of the soil were able to supply nearly 800 lb. of lime in the course of the rotation, the greater part of which was found in the drainage and the remainder in the crops. In addition to this lime a large amount of the bases soda and magnesia was also found in the drainage.

The bases washed away in the drainage were increased by manuring, such as was given on Nos. 2 and 3. The addition of sulphate of ammonia, for instance, on these drain gauges resulted in more base being washed away in combination with the sulphate, consequently we find that there is more lime and also more soda and magnesia in the drainage of No. 2 than in the drainage of No. 1. Even in the case of No. 3, though the addition of a considerable dressing of lime supplied more available lime, and therefore, as might be expected, more is found in the drainage, more soda and magnesia also were washed away than in the case of No. 1.

Ground lime equivalent to two tons of carbonate of lime per acre was added to No. 3 in 1921, and again in the winter of 1925, in preparation for the second rotation. All the results show that on this soil such a dressing of lime once in a rotation of six years is quite sufficient to maintain the supply of available base in the soil, for in the case of No. 3 the total amount of bases lost in the drainage, calculated to their equivalent of lime, did not equal the available lime supplied in a dressing of ground lime at a rate equivalent to 2 tons of carbonate of lime per acre. This is a valuable result, as it gives direct evidence as to the rate of exhaustion of lime from the soil, a subject concerning which there has been some uncertainty.

Drainage experiments, such as those at Craibstone, cannot be carried out without the expenditure of a very great amount of time, labour, and anxious thought, but the results collected carefully for a series of rotations are of very great value. They require to be repeated on soils of different types and under different conditions of climate. Only in this way can we get complete information concerning what is removed from the soil by the water which percolates through it and

by the growth of crops, and of the rate at which manures are exhausted from the soil. The information collected also throws valuable light on the processes of soil formation and development.

Finally, I would like to pay a tribute to my assistant, Mr H. D. Welsh, who has charge of the drain gauges, and through whose patient and careful work the results recorded in this paper were obtained.

THE INFLUENCE OF DIET ON SUSCEPTIBILITY TO DISEASE.

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THE most interesting feature in the advance in the science of nutrition made during the last twenty years has been the discovery of a number of previously unknown food constituents which exercise a powerful influence on health. This discovery has stimulated research on the whole question of the relationship of food to the incidence of disease, and knowledge is rapidly accumulating on the effect of deficiency or excess of the various dietary constituents. Concurrently with this laboratory research, a number of observations on the effect of different diets on health in both human beings and animals under ordinary conditions are being made. As a result of this experimental work and clinical observation, it is now recognised that the diet, especially in relation to the vitamins, inorganic elements, and the quality of the protein, has a profound influence not only on rate of growth and reproduction, but also on health. It is now possible to attribute certain diseases solely to specific errors in the diet, and there is evidence to show that in the case of some other diseases, though dietary errors are not the sole cause, they are important contributory causes in rendering the animal more susceptible.

Although some of this information is already being applied in practice, much of it is as yet only of potential value. It all, however, has a direct bearing on animal husbandry and public health. Probably the most important and most hopeful work in biological research at the present time is in connection with the attempt to obtain more light on this obscure field of scientific knowledge and to apply it to the prevention of disease.

The present paper is intended to give a short review of the information already accumulated and an indication of the way in which further research effort is being directed.

Let us briefly consider first the influence of food on the physiological processes in the body, as the disturbance of these normal processes is the ultimate basis of all disease.

The Effect of Composition of Food on Physiological Processes.

—In addition to the combustible material used for the main-

tenance of heat and supplying the energy for muscular movement, the food supplies the substances from which the tissues and fluids of the body are built up. These tissues and fluids must be maintained at approximately constant composition to enable the various organs of the body to perform their functions properly. But there is a continuous breaking down and loss of substances from the tissues and fluids. These are replaced from ingested food materials. When, however, over a prolonged period the diet is of such a nature that there is an absolute deficiency in the amount of one or more of the constructive materials needed, these substances cannot be replaced. The tissues become altered in composition. The change may be so slight that it cannot be detected by the crude methods of chemical analysis, or it may be a change in substances or properties which cannot even be detected by chemical analysis. Still, on account of this change, the proper physiological balance of the tissues and fluids is altered, and there is an interference with the normal functions.

These disturbances of the functions may become manifest in young animals in a slowing down of the processes of growth, or in mature animals by interference with the process of reproduction. If prolonged, they ultimately give rise to obvious symptoms of disease. We now recognise a group of what are known as deficiency diseases, which develop in this way from the lack of some particular food constituent. The recognition of the fact that there are diseases which are caused not by the presence of some pathogenic organism or toxic agent, but by the absence of some essential food constituent, is one of the most important landmarks in the history both of nutrition and preventive medicine.

But the diseases which take the heaviest toll in animal husbandry are infectious diseases—i.e., those due to the invasion of the blood or tissues by bacteria or other micro-organisms. It has been noted by several observers that experimental animals suffering from deficiency diseases appear to be more susceptible to some of the infectious diseases. This is in accordance with clinical observations made on human beings.

There are thus two aspects of the subject of diet and disease—viz., the direct effects of an inadequate diet in producing deficiency diseases, and the probably indirect effect in increasing susceptibility to some of the infectious diseases.

Deficiency Diseases.—It has been demonstrated by hundreds of laboratory experiments [Mendel, 1] that insufficiency of various food constituents, notably some of the vitamins, some of the inorganic elements, and some of the amino acids, leads to a stoppage of growth. Under experimental conditions, where the composition of the diet is known, young animals

can be made to grow or stop growing according as one or more of these dietary factors is put into or taken out of the diet. There are also certain constituents which affect reproduction, some being necessary for the occurrence of conception, and others for the normal development of the young. Rats can be rendered sterile by putting them on diets lacking certain constituents, and, if not continued too long on these diets, may be made fertile again by the inclusion in the diet of the substance lacking. Experiments with almost equally striking results have been done with cattle and pigs [Davidson, 2], although on account of the cost and length of time required to carry through experiments with the larger animals, fewer experiments have been done with them than with small animals.

In addition to these effects on growth and fertility, deficiencies in the diet lead to the development of well-defined symptoms of disease which are characterised by degeneration or abnormal development of some of the tissues, the change in the composition of these tissues being accompanied by specific symptoms. Thus, for example, in rickets, which occurs both in children and in young domestic animals, especially in pigs, there is a failure of calcification of the growing bone, and the bones become soft and spongy and ultimately deformed. This may arise from insufficiency of either of the two minerals required—viz., phosphorus and calcium, or from the lack of the vitamin which controls calcification. In scurvy, due to deficiency of vitamin C, some of the mucous membranes become spongy, hæmorrhages appear, and important ductless glands become abnormal. In beri-beri, which is produced in the absence of another vitamin, a change takes place in the nervous system which is accompanied, especially in birds, by characteristic inco-ordinated movements.

Our knowledge of some of these deficiency diseases is now so complete that we can produce them at will in experimental animals. The development of the symptoms within a certain time can be predicted with fair accuracy, provided the past nutritional history of the animal and the composition of the diet are known. Further, if the symptoms have not progressed too far, they may be cured at will by the inclusion in the diet of the missing constituents concerned.

Excesses of certain constituents in the diet may also have evil effects. Probably the most interesting example of the effect of excess is in the case of vitamin D, which is contained in great concentration in irradiated ergosterol, if, indeed, irradiated ergosterol be not vitamin D itself. This substance is a very powerful agent, active in minute traces in preventing rickets. Over-dosage, however, leads to rapid loss of weight, stoppage of growth, and abnormal deposition of calcium in some of the soft tissues [Harris and Moore, 3]. On the whole,

however, there is less danger from excesses than from deficiencies.

Some of these deficiency diseases have in the past been very common. Rickets, scurvy, and beri-beri have taken a heavy toll in human beings, and rickets continues to be a disease too common in pigs. Great progress is, however, now being made towards their elimination.

Although our knowledge of this aspect of nutrition has increased so rapidly during the past few years, it is still far from complete. Though we can produce or prevent some of these diseases at will by relatively gross manipulations of the diet, we do not yet know with certainty how much of each of the essential food constituents is necessary. We have not yet sufficient knowledge to build up for any particular animal a diet which is absolutely perfectly balanced with regard to all the various food constituents.

Infectious Diseases.—It is a common observation that animals in different herds, and even individual animals in the same herd, show different degrees of susceptibility to some of the infectious diseases. One of the most interesting questions in nutrition at the present time is whether, and to what extent, these different degrees of susceptibility can be correlated with difference in the previous nutritional history of the animal. A good deal of evidence has been collected to show that a correlation does exist in the case of some diseases.

A great deal of attention has been paid to the influence of diet on tuberculosis. Probably the most striking evidence on the influence of feeding on susceptibility to this disease was obtained in Germany as a result of the war. During and immediately following the war there was a great increase in the incidence of tuberculosis in Germany. Between 1914 and 1918 the tuberculosis mortality in cities of over 15,000 inhabitants increased three times [Addams and Hamilton, 4]. Not only was there an increase in the number of cases, but the type of the disease changed. There was an unusual number of acute types of cases which have become uncommon in civilised countries. It has been believed that a slight degree of infection, which is almost universal in all civilised communities, and which is usually successfully combated, leads to the development of an immunity against a more severe attack. This so-called racial immunity has been considered to be general in European countries. The outburst of this disease in Germany in the later stages of the war, when there was a general shortage of food, and a severe scarcity of certain kinds of food, throws doubt upon the value of the racial immunity. A German writer [Kiefer, 5] states that "the beautiful theories about disposition and immunity must, after the great experiment of the war, the blockade, the poverty, be completely revised," and the two American observers just

cited [4] are of opinion that "Germany's racial immunity, if there really be such a thing, was destroyed by the blockade."

It is believed by some that a similar course of events has occurred in the case of the North American Indians. Following the dispersal and destruction of the buffalo herds which provided their chief article of diet, and their confinement to locations on a very inferior diet, tuberculosis of an acute type spread with great rapidity among the Indians. It has been suggested by different writers [6, 7] that the cause was not the introduction of tuberculosis by the European, which had indeed occurred at earlier times, but the change in diet.

Several observations have been made on the influence of diet on pulmonary infections. Theobald Smith [8], an American investigator, noted that guinea-pigs when fed on a ration of cereal grains, hay, and carrots during the winter months suffered a high mortality from pneumonia. He was in some doubt as to the relative importance of diet and of seasonal variations in climate. In experiments with guinea-pigs at a later date at this Institute, it was found that on a series of rations graded with regard to their nutritive value, where infection with bacillus bronchisepticus occurred, the incidence of the disease was correlated with the nutritive value of the diet. Those on the more complete diet did not develop the disease, though exposed to the same infection as the others. A parallel observation has been made on African natives. It has been found that one tribe of natives, on a diet consisting largely of cereals and deficient in certain minerals, vitamins, and possibly also in protein, have a much higher incidence of pulmonary diseases than another tribe living under similar environmental conditions, but on a totally different and much better-balanced diet.

An observation on some experimental fowls affords a striking illustration of a disease of the respiratory tract—"nutritional roup," the resistance to which is affected by one constituent of the diet. This disease is caused by a micro-organism which invades the nasal passage of the fowl and produces a condition resembling diphtheria. We have observed in an experiment on fowls on a restricted diet that birds receiving a small daily dose of cod liver oil did not develop the disease, although they were in contact with and continually subject to infection from birds that were badly affected. The same observation has been made at several other centres.

M'Carrison [9], who is a pioneer in this field of research, has made some significant observations on an intestinal infectious disease. When working with monkeys, he noted that many of the animals fed on a diet of polished rice, which is incomplete with respect to both vitamins and minerals, developed dysentery, while control animals fed on a well-balanced ration remained free from the disease, though under similar

environmental conditions and exposed to the same risk of infection.

Even more remarkable is the effect of diet on the occurrence of certain intestinal parasites. Henry [10], in Australia, has found that sheep on pastures which are known to be deficient in certain constituents are more susceptible to infestation with intestinal parasites than sheep on a pasture which forms a more complete diet. This clinical observation tends to be confirmed [Orr, 11] by some preliminary experiments recently carried out in Kenya, where it was found that the feeding of a supplement of mineral salts, protein, and cod liver oil to sheep grazing on a pasture which was deficient in certain constituents, diminished markedly the susceptibility to parasitic infestation.

These observations to which we have referred so far were made on human beings or animals under conditions which were not purposely designed to test the effect of the diet on susceptibility to infectious diseases. The suggestive ideas to which they gave rise gave a stimulus to systematic inquiry. The investigations undertaken are of two kinds—viz., surveys to ascertain whether any connection can be found between diet and disease, and feeding experiments with animals to test the effects of different diets on susceptibility to certain infections. Illustrations of each of these lines of inquiry are given below.

Surveys.—A dietetic study of two native tribes was recently carried out in East Africa. One tribe was almost entirely vegetarian. The diet, which consisted largely of maize and other cereals, was found to be deficient in calcium, and probably also in protein and in certain vitamins. The other tribe was largely carnivorous. The food, consisting mainly of meat, milk, and blood, was rich in calcium, protein, and certain of the vitamins believed to be deficient in the diet of the vegetarian tribe. The following figures show the relative frequency of occurrence of some of the common diseases in the two tribes :—

PERCENTAGES OF TOTAL CASES OF SICKNESS.

	Diet chiefly Cereals, <i>e.g.</i> , Maize, &c.	Diet chiefly Meat, Milk, Blood.
Pulmonary conditions (bronchitis and pneumonia)	31	4
Tropical ulcers	33	3
Phthisis (tuberculosis) . . .	6	1
Helminthiasis (intestinal para- sites)	5	2
Rheumatoid arthritis . . .	2	35

Correlated with the marked difference in the diet is a marked difference in the nature of the diseases most prevalent in the two tribes. The figures suggest that the high incidence of pulmonary conditions and tropical ulcers in the one case is due to deficiencies in the diet which increase the susceptibility of the tribe to those conditions, and that the high incidence of rheumatoid arthritis in the other case may be due to toxæmia originating in the intestine or elsewhere as a result of the nature of the diet.

Several studies have been made of school children to ascertain whether children who are under weight, and therefore presumably suffering from under-nutrition or malnutrition, are more susceptible to tuberculosis than well-nourished children. In one survey of the children of nine schools [Chadwick, 12], it was found that 33 per cent of the under-weight children were tuberculous, as against an incidence of about 10 per cent of all children. In another study [Wolfe, 13] of the children who were under weight and were on diets which would have been improved by the addition of milk or vegetables, 60 per cent were suffering from tuberculosis. These results are taken as suggestive that under-nutrition or malnutrition decreases resistance to this disease. It should be noted, however, that these figures by themselves do not afford conclusive evidence that under-nutrition predisposes to tuberculosis. As this disease itself produces wasting, there is no evidence to show how much of the 'under weight' is due to the disease and how much to feeding. All that can be said is that the results are suggestive, and so far as they are valid, confirmatory of other observations referred to above.

These surveys afford evidence that bad feeding may be an important factor in reducing resistance to tuberculosis and pulmonary infections.

Feeding Experiments.—In feeding experiments, groups of animals are fed on diets designed to be deficient in one or more nutrients. After they have been on the diet for some time their susceptibility to infection is compared with that of similar animals on complete diets. A number of experiments of this kind were carried out by Morton on rabbits and guinea-pigs at this Institute. It was found that the blood of growing animals, fed on a ration of cereals which is deficient in calcium and some of the vitamins, had a lower percentage of calcium and a higher percentage of phosphorus than animals of the same age fed on the same ration with the addition of lime salts and cod liver oil or green food. Accompanying the altered composition of the blood, there was a definite difference in the powers of the animal to resist infection with tubercle bacilli. When subjected to an equal infection animals on diets to which the additions had been made survived

about twice as long as those on deficient diets without additions.

Similar work in America [Grant, Surgenaga, and Stegeman, 14] has shown that rats reared on a 'rickets-producing diet,' which has the same deficiencies as the cereal ration in Morton's experiment, become susceptible to tuberculosis, while rats on a normal diet remain immune to the disease.

The results of this preliminary work with small animals, taken together with the information obtained in the surveys and the clinical observations already discussed, afford strong evidence that deficiencies in the diet, if continued over long periods, may result in changes in composition of the blood and tissues, accompanied by increased susceptibility to some of the infectious diseases. We are at least justified in accepting this tentative conclusion as a working hypothesis and putting it to the test on farm animals. Experiments are now being done with cattle and sheep. It will be two or probably three years at the earliest before definite results are obtained, and it is quite impossible to predict what the nature of these will be. It is hoped, however, that whether positive or negative, they will increase our knowledge of this difficult and obscure subject.

Potential Importance for Stock Farming.—The losses to stock farming due to disease are enormous. Amongst such losses have been included not only deaths, but losses caused by non-fatal diseases, such as mastitis, contagious abortion, and sterility arising from infections of the uterus. In the past we have attempted to prevent or cure disease by a direct attack upon the micro-organisms—*e.g.*, by killing with anti-septics or attempting to remove them by improving the hygienic conditions, or by increasing the power of the animal to kill them by vaccines or sera. These direct methods have met with a considerable amount of success, and results of great economic value have been achieved. The question now being considered is whether, in addition to this direct attack, defence against diseases could be increased by raising the resistance of the animal through its nutrition. Can we render animals more resistant by arranging the ration to be rich in certain constituents which appear to have an influence on some diseases at least, and by taking full advantage of environmental factors, especially of sunlight, which affects the assimilation of these constituents? Some workers have a firm belief in this new line of attack. Thus, for example, M'Carrison, who is a leading authority on deficiency diseases, has expressed the view that "perfect food affords protection against the ravages of bacterial and other pathogenic organisms as adequately as does segregation or immunisation." If the tentative views put forward in this and in previous papers

by the writer [15, 16] should prove to be correct, the attack on disease in farm stock will be intensified and carried out on a wider front by groups of workers including physiologists and nutritional experts in addition to clinicians and bacteriologists. It is significant that during the last few years the workers at this Nutrition Institute, and those at the Animal Diseases Research Institute at Edinburgh, have found that their lines of investigation are converging on the same broad fundamental problems, and that this is leading to co-operation in which the clinician, the bacteriologist, the pathologist, and the physiologist are all bringing the knowledge from their respective branches of science. There is likely to be in the future a development of co-operation of this kind in the attack on disease. A combined effort by workers approaching the problem from different angles and each with information supplementing that brought by his colleagues will increase the likelihood of obtaining results of economic value in the near future.

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CATTLE FEEDING.

REPORT ON EXPERIMENTS COMPARING HEAVY ROOT, MEDIUM ROOT, AND NO ROOT RATIONS.

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THE experiments dealt with in this report were carried out at the College Farm, Kilmarnock, during the winters of 1927-28, 1928-29, and 1929-30. The main points regarding which conclusive information was desired were the following :—

Is the old-established practice of feeding a liberal allowance of roots to fattening cattle still fully justified by results ?

Is it possible to cut down materially the daily allowance of roots without adversely affecting the rate of progress of the cattle, or without raising the cost of beef production ?

On farms where roots can be successfully grown, is it an economic proposition to dispense with them entirely in the winter fattening of cattle ?

In addition to the foregoing, the opportunity was taken to glean further information regarding the amount of water consumed by cattle with free access to it at all times, but on rations that were materially different.

The experiments under consideration assume special importance not only because of the fact that the turnip crop is costly to grow, and owing to the incidence of disease and pest attacks liable to fail, but also on account of the very strong statements made in recent years by a well-known dairy expert regarding the value of roots for dairy cows, as, in that connection, it is not unreasonable to expect that what holds good for the fattening animal will be equally true for the dairy cow.

PLAN OF THE EXPERIMENT.

In the first year of the trial 18 bullocks were selected from a group of 21 that were available, and these were arranged in three groups with six animals in each.

In the second year twelve heifers and six bullocks were selected from a group of 20, and these were again arranged in three groups, the precaution being taken to have four heifers and two bullocks in each group.

In the third year bullocks were again utilised for the experi-

ment, and 18 were selected from a group of 22 that were available.

In each of the 3 years all of the cattle used in the experiment were 'Blue-greys' (crosses between the Shorthorn Sire and the Galloway Cow). They were home-bred animals of a very good class, and each year they were arranged in such a way as to have the groups as nearly as possible alike at the commencement of the experiment.

The cattle were put into the feeding boxes each year about the middle of October, two animals being housed in each box.

The feeding boxes are of a type specially suitable for experimental work. Each one was equipped with glazed fireclay troughs for concentrates and roots and a rack for hay or straw. In addition, there was a plentiful supply of water, and water meters, which recorded the water taken by each group of cattle, were fitted to the supply pipes.

RATIONS FED TO THE CATTLE.

In the 1927-28 experiment the rations fed to the cattle were as follows :—

GROUP I.—*Heavy Root Ration*—

- 80 lb. Swedes.
- 8 lb. Straw.
- 6 lb. Hay.
- 7 lb. Concentrate Mixture A.

GROUP II.—*Medium Root Ration*—

- 40 lb. Swedes.
- 8 lb. Straw.
- 10 lb. Hay.
- 7 lb. Concentrate Mixture A.
- 1½ lb. Concentrate Mixture B.

GROUP III.—*No Root Ration*—

- 8 lb. Straw.
- 14 lb. Hay.
- 7 lb. Concentrate Mixture A.
- 3 lb. Concentrate Mixture B.

The following were the components by weight of Concentrate Mixtures A. and B. :—

- Mixture A.* 4 parts Crushed Oats.
- 2 parts Decorticated Earth Nut Cake.
- 1 part Linseed Cake.
- Mixture B.* 1 part Linseed Cake.
- 1 part Flaked Maize.

In the 1928-29 experiment the daily allowance of Concentrate Mixture A. was reduced to 5 lb. This reduction was necessary, as the cattle were smaller than those of the

previous year. The allowance of Swedes, Hay, and of Concentrate Mixture B. was the same as in 1927-28, also of straw, though the full amount was not eaten.

In 1929-30, the third year of the experiment, the rations were exactly the same as in the other two years, excepting that in keeping with the live weight of the cattle a daily allowance of 6 lb. of Concentrate Mixture A. was fed at the commencement of the experiment.

To keep pace with live-weight increase, Concentrate Mixture A. was increased in each of the years by $\frac{1}{2}$ lb. per animal every two weeks.

It will be seen that the rations were the same in each year except for the allowance of Concentrate Mixture A., which was varied in keeping with the average live weight of the cattle. Further, that $1\frac{1}{2}$ lb. of Concentrate Mixture B. and 4 lb. Hay were introduced into the ration to replace 40 lb. of Swedes, and that double these amounts, namely 3 lb. of Concentrate Mixture B. and 8 lb. Hay, were substituted for 80 lb. Swedes. These quantities are very much alike as regards total dry matter and food nutrients.

DURATION OF THE EXPERIMENT.

The experiment commenced each year about the middle of October and was continued for a period of twelve weeks.

Fortnightly weighings were carried out during the experimental period, and through the courtesy of Messrs T. Donald & Sons, Auctioneers, Kilmarnock, the cattle—as in former trials—were weighed on the market weighbridge.

The cattle market is only about one mile distant from the College Farm, and the short walk from the farm to the market did not upset the animals in any way, but was actually an advantage in that it tended to lessen variation in the weights recorded.

RESULTS FROM THE DIFFERENT RATIONS.

The tables at the end of this short article give full particulars regarding the progress of the animals in the different groups, and from these it will be seen that while the live-weight increases were often abnormally high during the first few weeks of the trial, in the final period of the experiment the rate of progress was much slower. This was very pronounced in the 1927-28 experiment, and slowing down in that year was in great measure due to the fact that the cattle at the end of the feeding period were 'prime' fat and consequently were putting on little live-weight increase. When these animals were slaughtered they gave—as was to be expected—a high percentage of carcase weight.

In the second year of the trial the average weekly live-weight increases were higher and progress was a little steadier throughout the whole experiment, but in that year the cattle were hardly so good at the beginning of the trial and not just so prime at the end of it. When slaughtered a rather lower percentage of carcase was the result.

The position in the third year was somewhat similar to the second, despite the fact that when killed the liver of every animal was found to be affected with 'fluke.'

The average rates of increase for the different groups in the three seasons were as follows:—

AVERAGE LIVE WEIGHTS AND WEEKLY INCREASES.

	Average Live Weight at		Average Weekly Increase over 12-week period.
	Beginning of Experiment.	End of Experiment.	
GROUP I. Heavy Root Ration—	lb.	lb.	
1927-28	1132	1323	15.9
1928-29	870½	1115½	20.4
1929-30	1062	1269	17.3
Average	1021½	1236	17.8
GROUP II. Medium Root Ration—			
1927-28	1132	1330	16.5
1928-29	868	1131½	22
1929-30	1062	1269½	17.3
Average	1020	1243½	18.6
GROUP III. No Root Ration—			
1927-28	1132	1276½	12
1928-29	875	1087½	17.7
1929-30	1062	1230	14.0
Average	1023	1195½	14.6

The foregoing weights show the average weekly increase over the three years' trial for the 18 cattle which constituted each group to have been as follows:—

Heavy Root Ration	17.8 lb. per animal.
Medium Root Ration	18.6 lb. "
No Root Ration	14 lb. "

The difference in the rate of increase from the Heavy and Medium Root Rations is comparatively little, and the animals in both groups did remarkably well.

The No Root Ration, however, did not prove so successful, and, though the cattle made quite good progress at first without roots, their weekly rate of increase generally proved a little disappointing before the end of the experiment.

Apart from the lower weekly increase in live weight, the No Root group of cattle were not in quite the same bloom as the others. They were drier in their skins, not so well filled out, and lacked the sappy appearance of the animals receiving roots as part of their ration. Further, they were not just so well finished, and in the fat market would scarcely have realised the same price per cwt. live weight.

In order to ascertain if the different rations had any marked effect on carcase weight relative to live weight, the cattle utilised in the experiment were sold each year to the Kilmar-nock Equitable Co-operative Society on the dead-weight basis, and the following are the carcase weights and the percentages of carcase weight to unfasted live weight for the different groups.

UNFASTED LIVE WEIGHT AND CARCASE WEIGHT.

RATION.		HEAVY ROOT. 1927-28.			MEDIUM ROOT. 1927-28.			NO ROOTS. 1927-28.		
Animal.		Live weight Unfasted.		Carcase Weight.	Live weight Unfasted.		Carcase Weight.	Live weight Unfasted.		Carcase Weight.
No.	cwt. st.	lb.	%		cwt. st.	lb.	%	cwt. st.	lb.	%
1	12 0	788	58.7		11 7	788	59.2	11 0	738	59.9
2	11 1	762	60.3		11 5	790	60.6	10 4	700	58.6
3	11 7	792	59.5		12 1	820	60.3	10 6	708	58.8
4	11 1	768	61.6		10 7	716	58.7	11 5	774	59.4
5	12 4	840	60.0		11 5	774	59.4	11 3	772	60.6
6	12 2	858	62.5		13 1	914	62.1	13 1	896	60.9
		1928-29.			1928-29.			1928-29.		
7	9 3	587	55.4		11 0	700	56.8	8 0	491	54.8
8	9 7	608	55.0		10 3	633	54.5	10 2	610	53.1
9	8 1	503	55.3		9 1	583	57.5	9 4	574	54.0
10	11 2	703	55.8		9 1	547	53.5	9 0	541	53.7
11	11 2	725	57.5		9 4	608	57.1	11 0	655	53.1
12	9 7	616	55.7		11 4	727	56.4	10 4	666	56.7
		1929-30.			1929-30.			1929-30.		
13	11 2	721	57.2		10 7	690	56.6	10 7	657	53.9
14	10 3	647	55.7		10 0	632	56.4	10 7	665	54.6
15	10 7	714	58.6		11 0	680	55.2	10 0	607	54.2
16	12 6	801	56.1		11 2	684	54.3	11 1	682	54.7
17	11 2	710	56.3		12 7	821	56.9	11 1	710	57.0
18	11 4	723	56.1		12 0	725	53.9	11 7	718	54.0
Average.		57.8			57.8			56.4		

To some readers the foregoing percentages of carcase weight to live weight may seem low for well-finished cattle, but in that connection special attention should perhaps be directed to the fact that the percentages given are relative to the *unfasted live weights*—a factor which makes a very big difference.

During the years the experiments were in progress the cattle weighings were always carried out at the same hour in the early afternoon, the animals having received their morning and mid-day meals prior to being weighed. An average loss of weight of even $\frac{1}{2}$ cwt. per animal—though that is considerably below what the actual loss on fasting would be—would raise the carcase weight for the 54 animals used in the experiment to approximately 60 per cent of the live weight, and the 36 animals on the Root Rations to well over that figure.

REPORT ON CARCASSES.

In order to ascertain if the different rations had any pronounced effects on the condition of the carcasses, arrangements were made to have these carefully examined. This was done at the end of the second experiment by Mr Cameron of Cardonald, Mr Rainey of Kilmarnock, and Mr Cochrane, the Supervisor of Experiments.

All of the carcasses were good, but the finish was slightly better in the case of the animals on the Root Rations. The following notes were prepared by the experts already referred to :—

GROUP I.—*Heavy Root Ration.*

- No. 7. Good carcase of beef. Exceptional bullock over back. Colour very good. Well fleshed and flesh nicely marled. Fat evenly distributed. Kidney good and flank good. A prize butcher's carcase.
- No. 8. Good carcase. Back good. Colour very good. Fleishy carcase with well-mixed beef. Kidney good. Fat evenly laid on. A little wanting in the thighs.
- No. 9. A prime carcase, although a trifle bare over the loins. Hind-quarters very good. Colour very good, and flesh well mixed. Kidney and flank very good.
- No. 10. A good carcase. Outside colour excellent, but inside colour not so good. Slightly overfat over the rump. Very good along the ribs. Kidney and flank very good.
- No. 11. A good carcase. Evenly fleshed and well mixed. Colour very good. Kidney and flank very good. A good butcher's beast.
- No. 12. A very prize carcase. Well and evenly fleshed with an excellent colour. Beef well mixed. Slightly over-fat on ribs. Flank not overdone. Kidney very good.

GROUP II.—*Medium Root Ration.*

- No. 7. A very useful carcase. Colour satisfactory, with a bright inside colour. Fat evenly laid on and white. Kidney and flank good. Flesh well mixed.
- No. 8. A prime carcase. Fine colour. Fat evenly laid on. Flesh finely marled and mixed. Kidney very good. Flank good.
- No. 9. A good carcase. Colour good. Good over back. Well lined with fat, evenly distributed. Kidney good. Rather thin in flank.
- No. 10. A fairly good carcase. Colour good. Back fair and flesh well mixed, but kidney small and rather thin flank.
- No. 11. A very good carcase. Colour very good. Very good over back, and kidney good. Fat well and evenly laid on except at flank, where a little thin.
- No. 12. A nice beast; very prime. Outside colour very good. Slight patchiness at tail-head, but very nice along ribs. Flesh well marled. Kidney fairly good. Flank good.

GROUP III.—*No Roots.*

- No. 7. A fair carcase, just short of real finished condition. Colour a little dark. Kidney moderate and flank thin. No selvedge.
- No. 8. A good carcase; outside colour good. Well finished and flesh nice in marl. Kidney not particularly good. Flank rather thin. Dryness of flesh apparent.
- No. 9. A fair carcase only. Colour fair. Thin in flesh and moderate kidney. Lacking in flank.
- No. 10. A fairly good carcase. Colour good. Not too well fleshed over ribs. A little wanting in kidney. Flesh well mixed. Flank fairly good.
- No. 11. A good carcase. Colour good. Very good back, with fat evenly laid on. Excellent kidney and good flank. Marling nice.
- No. 12. A good carcase. Colour fairly good. A good back, with a fair amount of outside fat. Kidney only fair. Flank fairly good. Nicely marled and mixed beef.

WATER REQUIREMENTS OF FATTENING CATTLE.

A good deal of work has been done in connection with the amount of water taken by dairy cows, with the result that the requirements per gallon of milk produced are now fairly well established; the requirements of fattening cattle, however, do not appear to have been the subject of many special investigations.

It is well known that cattle getting a big allowance of roots take little, if any, water when they are offered it. They seem to get all they require from the roots, and do quite well without any additional allowance. With a small root ration, however, they must have access to it, otherwise progress is retarded. The fact should never be overlooked that well-nigh half of the live-weight increase put on by cattle during growth and in the earlier stages of fattening consists of moisture, and as that is the cheapest item in the ration it should never be the one to retard progress.

In view of the fundamental differences in the rations fed to the three groups of cattle, the opportunity was taken to obtain more exact information as to the amount of water consumed by the animals getting these rations.

As has already been indicated, the feeding-boxes were equipped with water bowls, and the amount of water taken by each group of cattle was registered on the special water meters installed for that purpose.

The actual individual consumption of each animal could not be measured, as there were two animals in each of the fattening pens. There was, therefore, only opportunity for ascertaining average consumption.

The records were taken for the three years the experiment was in progress, but, owing to certain happenings, the results for the second year were not considered entirely reliable, and are not given in the table below. In the last year of the trial very special attention was paid to the water consumpt, and the moisture content of the roots was also ascertained. In this way the total amount of water, inclusive of the moisture in the roots, taken by each group of cattle was arrived at.

The amounts taken from the water-bowls for the 1927-28 and 1929-30 experiments were as follows :

AVERAGE WATER CONSUMPTION PER ANIMAL PER DAY.

	1927-28.	1929-30.
	Gallons.	Gallons.
Heavy Root Ration . . .	1.75	2.88
Medium Root Ration . . .	4.07	5.19
No Roots	8.20	8.66

When we include the moisture content of 80 lb. and 40 lb. of roots, which examination showed to be 89.05 per cent of water, the average consumption for each group in the 1929-30 experiment, and which the writer believes may be taken as fairly representative of the requirements of fattening cattle in general, was as follows :—

	Average Daily Consumption from Water-bowls.	Moisture Content of Roots.	Total amount of Water per Day.
	Gallons.	Gallons.	Gallons.
Heavy Root Ration .	2.88	7.12	10
Medium Root Ration .	5.19	3.56	8.75
No Roots	8.66	—	8.66

It would appear from the foregoing that, in the case of fattening cattle scaling from 10 to 11 cwt. live weight, even a root allowance of 80 lb. per day does not fully meet their desire for water, which may be put at approximately 9 to 10 gallons per day. For that purpose about 100 lb. of roots would need to be fed, but whilst cattle getting that amount would have their water requirements fully provided for, such an allowance is excessive.

It is interesting to note that in the experiments under consideration the total amount of moisture was about three and a half times the weight of the total dry matter in the ration.

COST OF THE DIFFERENT RATIONS AND RELATIVE RETURNS THEREFROM.

The average consumption per head by the animals in each group for the full feeding period and the costs of the different rations were as follows :—

GROUP I.—

Concentrate Mixture A.	5½ cwt. @ £9 per ton	= £2 9 6
Straw	6 cwt. @ £2 do.	= 0 12 0
Hay	4½ cwt. @ £4 do.	= 0 18 0
Roots	3 tons @ 17s. do.	= 2 11 0
		<u>£6 10 6</u>

GROUP II.—

Concentrate Mixture A.	(as above)	= £2 9 6
Straw	do.	= 0 12 0
Hay	7½ cwt. @ £4 per ton	= 1 10 0
Roots	1½ tons @ 17s. do.	= 1 5 6
Concentrate Mixture B.	1½ cwt. @ £12 do.	= 0 13 6
		<u>£6 10 6</u>

GROUP III.—

Concentrate Mixture A.	(as above)	= £2 9 6.
Straw	do.	= 0 12 0
Hay	10½ cwt. @ £4 per ton	= 2 2 0
Concentrate Mixture B.	2½ cwt. @ £12 do.	= 1 7 0
		<u>£6 10 6</u>

On the above basis the different rations are identical in cost, which works out at 10s. 10½d. per week for the feeding period of twelve weeks' duration.

The financial aspect can perhaps be best brought out by considering the value of the roots for beef production relative to the concentrates and hay used to replace them.

If the cattle on the No Root Ration had done as well as those receiving respectively 80 lb. and 40 lb. of roots per day the value of the roots relative to the hay and concentrates used to replace them would have been exactly 17s. per ton, the price at which they have been charged in arriving at the costs of the rations.

The rations containing roots, however, proved superior to the No Root Ration, and to get at the relative consuming value of the roots that must be taken into account.

Working first from the carcass weights, and dealing with Groups I. and III., the average carcass weights of which were as undernoted, we get the following result:—

GROUP I.	.	.	.	.	.	714 lb.
GROUP III.	.	.	.	.	.	676 lb.
						<hr/>
Increase from Root Ration						38 lb.

The cattle were sold at an average price over the three years of 10d. per lb. carcass weight, and the financial superiority of the Root Ration is accordingly represented by 38 lb. increase at 10d. per lb. = 31s. 8d. per animal.

Three tons of roots were consumed by each animal in Group I., and that means that the relative value of the roots was 17s. (the price at which they have already been charged), plus 10s. 6d.—namely, 27s. 6d. per ton.

Taking next Groups II. and III., for which the average carcass weights were:—

GROUP II.	.	.	.	713 lb.
GROUP III.	.	.	.	676 lb.
				<hr/>
Increase				37 lb. Value @ 10d. = 30s. 10d.

Group II., however, only received 1½ tons of roots during the feeding period, and their value in the ration has accordingly proved very high, giving an increased return of 30s. 10d. per animal. This, when added to the price at which the roots have already been charged, makes their relative value in the ration 17s. plus 20s. 6d.—namely, 37s. 6d. per ton.

On the dead-weight basis, therefore, and with the other components of the rations at the prices charged, the superiority of the Root Rations is clearly established.

The result is equally conclusive on the live-weight basis. If we take the value per cwt. live weight as 56s., a figure perhaps a little high for the No Root group, we get the following result :—

GROUP I.—

Average live weight, 1236 lb. Value at 56s. per cwt. . £30 18 0

GROUP III.—

Average live weight, 1193½ lb. Value at 56s. per cwt. 29 17 9

Balance . . . £1 0 3

GROUP II.—

Average live weight, 1243½ lb. Value at 56s. per cwt. £31 1 9

GROUP III.—

Average live weight, 1193½ lb. Value at 56s. per cwt. 29 17 9

Balance . . . £1 4 0

The relative return for each ton of roots fed to Group I., which received 80 lb. per day, or in all three tons per animal, is therefore 17s., plus 6s. 9d., or 23s. 9d. per ton.

The corresponding return from Group II., which received 40 lb. of roots daily, or 1½ tons per animal, is 17s. plus 16s., or 33s. per ton.

SOME CONCLUSIONS THAT MAY BE DRAWN FROM THE RESULTS.

1. The old-established practice of feeding a liberal allowance of roots to fattening cattle is still fully justified by results.

2. It is possible to cut down the root supply without adversely affecting rate of progress or raising cost of beef production. This gives an enhanced return per ton of roots consumed, but increases dependence on purchased concentrates.

3. It is not an economic proposition to dispense with roots on farms where they can be successfully grown, and where the winter fattening of cattle is practised, as without roots the cattle would appear to make rather slower progress.

4. Cattle of about 10 to 11 cwt. live weight would appear to require the equivalent of about 9 to 10 gallons of water per day.

The writer desires to acknowledge the valuable services rendered by Mr Cochrane, under whose capable supervision the feeding experiments were carried out.

TABLE SHOWING THE INDIVIDUAL INCREASES MADE
BY THE CATTLE IN EACH GROUP.

GROUP I.—HEAVY ROOT RATION.

1927-28.

No.	October				November				December				January		Increase.	
	11th.		25th.		8th.		22nd.		6th.		20th.		3rd.			
	cwt.	st.	cwt.	st.	cwt.	st.	cwt.	st.	cwt.	st.	cwt.	st.	cwt.	st.	cwt.	st.
1	10	1	10	6	11	1	11	3	11	5	11	7	12	0	1	7
2	9	3	9	3	10	2	10	4	10	6	10	7	11	1	1	6
3	10	0	10	4	11	0	11	3	11	4	11	6	11	7	1	7
4	9	5	9	7	10	3	10	6	10	7	11	0	11	1	1	4
5	10	6	11	0	11	6	12	0	12	1	12	2	12	4	1	6
6	10	6	11	0	11	6	12	0	12	2	12	2	12	2	1	4

1928-29.

No.	October				November				December				January		Increase.	
	16th.		30th.		13th.		27th.		11th		26th.		8th			
	cwt.	st.	cwt.	st.	cwt.	st.	cwt.	st.	cwt.	st.	cwt.	st.	cwt.	st.	cwt.	st.
7	7	4	7	5	8	4	8	6	9	0	9	1	9	3	1	7
8	7	6	8	0	8	4	9	0	9	1	9	3	9	7	2	1
9	6	4	6	6	7	6	7	6	8	0	8	1	8	1	1	5
10	9	0	9	3	10	4	10	6	10	7	11	0	11	2	2	2
11	8	4	9	1	10	1	10	4	10	6	11	0	11	2	2	6
12	7	3	8	0	8	4	8	7	9	2	9	2	9	7	2	4

1929-30.

No.	October				November				December				January		Increase	
	15th.		29th.		12th.		26th.		10th.		24th.		7th.			
	cwt.	st.	cwt.	st.	cwt.	st.	cwt.	st.	cwt.	st.	cwt.	st.	cwt.	st.	cwt.	st.
13	9	2	10	2	10	3	10	4	10	6	10	7	11	2	2	0
14	8	6	9	1	9	4	9	5	10	1	10	2	10	3	1	5
15	9	0	9	4	9	7	10	0	10	6	10	6	10	7	1	7
16	10	6	11	2	11	6	11	6	12	3	12	4	12	6	2	0
17	9	3	9	6	10	1	10	3	10	7	10	7	11	2	1	7
18	9	6	10	0	10	3	10	4	10	7	11	1	11	4	1	6

GROUP II.—MEDIUM ROOT RATION.

1927-28.

No.	October				November				December				January		Increase.	
	11th.		25th.		8th.		22nd.		6th		20th.		3rd.			
	cwt.	st.	cwt.	st.	cwt.	st.	cwt.	st.	cwt.	st.	cwt.	st.	cwt.	st.	cwt.	st.
1	10	3	10	5	11	2	11	5	11	6	11	6	11	7	1	4
2	9	6	10	1	10	5	11	1	11	4	11	5	11	5	1	7
3	9	7	10	4	11	0	11	4	11	5	11	7	12	1	2	2
4	9	1	9	3	10	1	10	4	10	5	10	6	10	7	1	6
5	10	3	10	5	11	0	11	3	11	3	11	4	11	5	1	2
6	11	1	12	0	12	5	13	0	13	1	13	1	13	1	2	1

1928-29.

No.	October				November				December				January		Increase.	
	16th.		30th.		13th.		27th.		11th.		26th.		8th.			
	cwt.	st.	cwt.	st	cwt.	st	cwt.	st.	cwt.	st.	cwt.	st.	cwt.	st.	cwt.	st.
7	8	3	8	5	9	6	10	0	10	2	10	5	11	0	2	5
8	8	2	8	2	9	1	9	4	9	6	9	7	10	3	2	1
9	6	7	6	7	7	6	8	2	8	4	8	6	9	1	2	2
10	7	1	6	5	7	4	8	4	8	4	8	5	9	1	2	0
11	7	3	7	7	8	3	8	6	9	0	9	1	9	4	2	1
12	8	4	9	4	10	1	10	6	10	6	11	0	11	4	3	0

1929-30.

No.	October				November				December				January		Increase.	
	15th.		29th.		12th.		26th.		10th.		24th.		7th			
	cwt.	st.	cwt.	st.	cwt.	st.	cwt.	st.	cwt.	st.	cwt.	st.	cwt.	st.	cwt.	st.
13	9	3	9	7	10	1	10	2	10	4	10	6	10	7	1	4
14	8	5	8	5	9	0	9	3	9	5	9	7	10	0	1	3
15	9	0	9	2	9	7	10	0	10	4	10	5	11	0	2	0
16	9	3	10	0	10	2	10	3	10	6	10	6	11	2	1	7
17	10	4	11	1	11	5	11	6	12	1	12	4	12	7	2	3
18	10	0	10	3	11	0	11	0	11	4	11	5	12	0	2	0

GROUP III.—NO ROOTS.

1927-28.

No.	October 11th. 25th.				November 8th. 22nd.				December 6th. 20th.				January 3rd.		Increase.	
	cwt.	st.	cwt.	st.	cwt.	st.	cwt.	st.	cwt.	st.	cwt.	st.	cwt.	st.		
1	9	4	10	1	10	4	10	6	10	7	11	0	11	0	1	4
2	9	2	9	2	10	0	10	2	10	2	10	3	10	4	1	2
3	9	4	9	5	10	2	10	4	10	4	10	5	10	6	1	2
4	10	3	10	3	11	2	11	5	11	7	11	5	11	5	1	2
5	10	1	10	4	10	7	11	3	11	3	11	3	11	3	1	2
6	11	7	11	5	12	6	12	7	12	7	13	0	13	1	1	2

1928-29.

No.	October 16th. 30th.				November 13th. 27th.				December 11th. 26th.				January 8th.		Increase.	
	cwt.	st.	cwt.	st.	cwt.	st.	cwt.	st.	cwt.	st.	cwt.	st.	cwt.	st.		
7	6	6	6	7	7	4	7	5	7	7	7	6	8	0	1	2
8	8	3	8	5	9	3	9	5	9	5	9	6	10	2	1	7
9	8	0	8	0	8	5	9	0	9	0	9	0	9	4	1	4
10	7	4	7	6	8	1	8	3	8	6	8	5	9	0	1	4
11	8	1	9	0	9	7	10	2	10	4	10	3	11	0	2	7
12	8	1	8	7	9	3	9	6	9	7	10	0	10	4	2	3

1929-30.

No.	October 15th. 29th.				November 12th. 26th.				December 10th. 24th.				January 7th.		Increase.	
	cwt.	st.	cwt.	st.	cwt.	st.	cwt.	st.	cwt.	st.	cwt.	st.	cwt.	st.		
13	8	6	9	4	9	7	10	1	10	4	10	4	10	7	2	1
14	9	3	9	5	9	6	9	6	9	7	9	7	10	7	1	4
15	9	0	9	4	9	5	9	6	9	4	9	5	10	0	1	0
16	9	5	10	0	10	3	10	3	10	5	10	6	11	1	1	4
17	10	0	10	3	10	4	10	5	11	0	11	1	11	1	1	1
18	10	1	10	4	10	7	11	0	11	4	11	5	11	7	1	6

THE DENTITION OF THE PIG.

By PRINCIPAL O. CHARNOCK BRADLEY, M.D., D.Sc., M.R.C.V.S.,
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APART altogether from the normal physiological use to which they are put, and because of the employment of the state of the teeth as indicative of age, the dentition of domestic animals must always be of interest to the breeder and exhibitor.

The complete adult dentition of the pig consists of forty-four teeth grouped as follows: 3 incisors, 1 canine, 4 premolars, and 3 molars, on each side, above and below. The incisors of the upper and lower jaw differ considerably, as may be gathered from the accompanying diagram (Fig. 1). In addition to the differences in shape, the upper and lower incisors are grouped differently, the upper being separated from each other by spaces, while the lower teeth are close together. Most conveniently—and technically—the incisors are named numerically: first, second, and third, beginning with that nearest the middle line of the head. Commonly, however, the first is known as the *central* incisor, the second as the *lateral*, and the third as the *corner* tooth.

For the purposes of these notes the canines demand no comment beyond the reminder that they are better developed in the male than in the female; a difference dependent upon the circumstances that these teeth are not constructed as organs of mastication but as weapons of offence and defence.

Concerning the premolars and molars, it is unfortunate that in many books no distinction is made between them: they are lumped together as 'molars,' the first, perhaps, being specially designated the 'premolar tooth.' If a comprehensive general term is needed—and certainly one is very convenient—it would be better to call them 'cheek teeth.' Mere convenience, however, should give way to precision, and the claims of precision are strengthened by the fact that the real molars—that is, the last three teeth on each side, above and below—are not represented in the deciduous ('milk' or temporary) dentition, and consequently do not make their appearance until the pig is several months old. The second, third, and fourth premolars, on the other hand, have predecessors in the 'milk' dentition, these being cut during the first few weeks after birth, to be shed and succeeded by

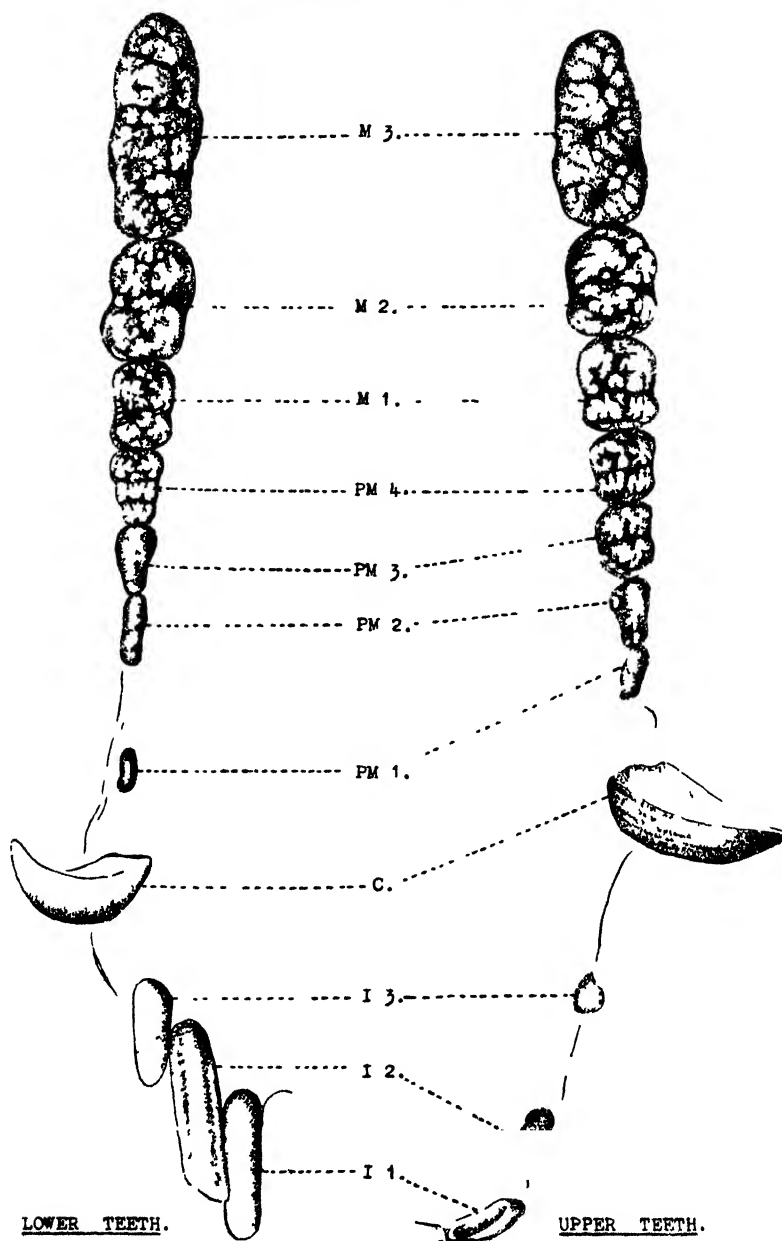


Fig. 1.—Diagram of the unworn teeth of the pig.

I 1, 'Central' incisor; I 2, 'lateral' incisor; I 3, 'corner' incisor; C, canine (tusk); PM 1, PM 2, PM 3, PM 4, first, second, third, and fourth premolars; M 1, M 2, M 3, first, second, and third molars.

permanent teeth somewhere about the age of twelve months or shortly thereafter.

The first premolar in many—it might perhaps be said in most—mammals is of great interest to the comparative anatomist, because of its inconsistency in Mammalia generally, and the frequency with which it fails to have a predecessor in the temporary dentition of those animals in which it usually occurs. The pig is one of the mammals in which a deciduous first premolar does not occur; and, as will be shown later, the presence of a permanent lower first premolar is by no means constant. When the tooth is present in the lower jaw it dissociates itself from the other cheek teeth, and occupies a position about the middle of the gap between the canine and the second premolar.

The cheek teeth taken together exhibit remarkable differences in size, shape, and complexity of their crowns. The first is the smallest and relatively very simple in form: the last is the largest and has a crown that, when unworn, is crowded with small rounded tubercles or cusps. From the second tooth to the last the number of tubercles and the complexity of their arrangement gradually increases, and a casual inspection might easily lead to the conclusion that the arrangement of the cusps is haphazard. More careful examination, however, reveals a definite and regular grouping, which becomes more obvious as friction obliterates the highest of the projections.

However interesting the teeth of the pig may be to the comparative anatomist, the breeder and exhibitor regards them from their ability—within limits—to indicate the age of the possessor. Tables to show the age at which the individual teeth are cut have been constructed from time to time, but there is evidently a growing doubt whether dentition tables framed years ago are safe guides nowadays when breeding and feeding practices have changed and earlier and still earlier maturity is sought. There are those who hold at least a suspicion that early maturity may be associated with the earlier eruption, and perhaps also with more rapid growth of the teeth. And doubt is not stilled when two authorities writing in the English language—one British and the other American—are not in entire agreement. In this country, for many years, the pamphlet by the late Sir George T. Brown has been accepted as a guide. More recently an American text-book on Anatomy (by Sisson) has appeared, and therein is given a dentition table that we may assume indicates the times of appearance and change of the teeth of American pigs.

Unfortunately, Brown¹ did not reduce his notes to actual

¹ 'Dentition as indicative of the Age of Animals of the Farm.' By Professor Sir George T. Brown. 7th edition, 1920, pp. 51-61.

tabular form, and it is none too easy to do this for him. An endeavour, however, is here made to do so, short quotations from the author's text being given in brackets wherever it is considered that these will assist the reader.

BROWN :—

- i 1. 1 month (" . . . above the gum . . .").
2 months (" . . . fully developed . . .").
- i 2. 2 months (" . . . signs of erupting . . .").
3 months (" . . . nearly level " with i 1).
- i 3. Before birth.
- c. Before birth.
- pm 2. 1 month (" . . . just appearing through the gum . . .").
2 months (" . . . nearly level with " pm 3).
- pm 3. 1 month (" . . . well up . . .").
- pm 4. 1 month (" . . . well up . . .").
- I 1. 12 months.
- I 2. 17 to 18 months (" . . . in forward animals. . . . In many animals the temporary teeth remain up to the age of 18 months").
- I 3. 7 to 8 months (" . . . their points through the gum at seven months but in many cases the temporary organs remain until the animal has reached the age of eight months").
- C. 9 months (" . . . may be through the gum in very forward animals at this age " . . . "as a rule, the pig at the age of nine months has one or two of the temporary tusks still in position").
- PM 1. 5 months (" . . . evident signs of cutting . . .").
- PM 2. } 12 months (" . . . shortly after . . .") to 15 months.
- PM 3. } (" . . . fall irregularly . . . very regular in their de-
- PM 4. } velopment . . .").
- M 1. 5 months (" . . . remarkably regular . . .").
- M 2. 10 to 12 months (" . . . its perfect eruption may be taken as evidence that the pig has reached the age of one year").
- M 3. 17 to 18 months.

Sisson¹ is more considerate and gives a definite table, which is here reproduced for comparison.

SISSON :—

i 1.	2 to 4 weeks.
i 2. { Upper.	2 to 3 months.
{ Lower.	1½ to 2 months.
i 3.	Before birth.
c.	Before birth.
pm 2.	5 to 7 weeks.
pm 3. } { Upper.	4 to 8 days.
pm 4. } { Lower.	2 to 4 weeks.
I 1.	12 months.
I 2.	16 to 20 months.
I 3.	8 to 10 months.
C.	9 to 10 months.
PM 1.	5 months.
PM 2. }	12 to 15 months.
PM 3. }	
PM 4. }	
M 1.	4 to 6 months.
M 2.	8 to 12 months.
M 3.	18 to 20 months.

The writer of the present notes has found that a comparison of the above tables is made easier if a graphic method is employed. In the accompanying charts (Figs 2 and 3) the times of eruption of the individual deciduous and permanent teeth as stated by Brown and Sisson have been plotted along parallel lines, and it is probably unnecessary to enter upon a detailed discussion of the points of difference between these two authorities: it is hoped that they have been made apparent at a glance.

It is interesting to note that the leading Continental authorities on the anatomy of the domestic animals furnish a dentition table in which there are further differences. Ellenberger and Baum,² basing their statements on a dis-

¹ 'The Anatomy of the Domestic Animals.' By Septimus Sisson. 2nd edition, 1914, p. 481.

² 'Handbuch der vergleichenden Anatomie der Haustiere.' Von Wilhelm Ellenberger und Hermann Baum. 16te Aufl., 1926, pp. 202-203.

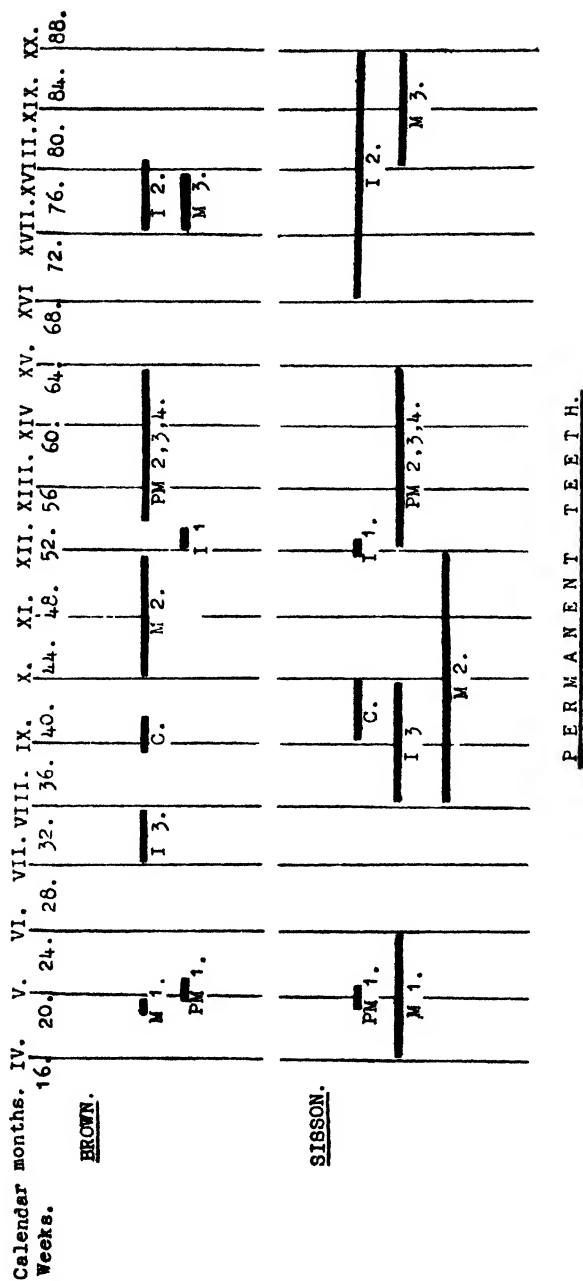


Fig. 3.—Chart of the periods of eruption of the permanent teeth of the pig.

I 1, I 2, I 3, first, second, and third incisors; C, canine; PM 1, PM 2, PM 3, PM 4, first, second, third, and fourth premolars; M 1, M 2, M 3, first, second, and third molars.

sertation by Engelberg,¹ divide pigs into three groups according as the dentition is early, medium, or late, as follows :—

ELLENBERGER AND BAUM :—

	Early.	Medium.	Late.
i 1. Upper.	3 to 21 days.	3 to 4 weeks.	5 weeks.
Lower.	1 to 14 days.		
i 2. Upper.	7 weeks.	12 weeks.	17 weeks.
Lower.	6 weeks.	8 weeks.	10 weeks.
i 3.	Before birth.		
c.	Before birth.		
pm 2.	7 weeks.	8 to 9 weeks.	10 weeks.
pm 3. Upper.	4 days.	8 days.	21 days.
Lower.	7 days.	3 to 4 weeks.	5 weeks.
pm 4. Upper.	4 days.	8 days.	30 days.
Lower.	2 weeks.	3 to 4 weeks.	7 weeks.
I 1.	11 months.	12 months.	14 months.
I 2. Upper.	16 months.	18 months.	20 months.
Lower.	16 months.	17 months.	18 months.
I 3.	6 to 8 months.	9 months.	10 months.
C.	6 months.	9 months.	10 months.
PM 1.	3½ months.	5 months.	6½ months.
PM 2.	12 months.	14 to 15 months.	16 months.
PM 3.	12 months.	13 to 14 months.	16 months.
PM 4.	12 months.	13 to 14 months.	16 months.
M 1.	4 months.	5 months.	6 months.
M 2.	7 to 8 months.	9 to 10 months.	12 to 13 months.
M 3.	17 months.	18 to 19 months.	20 to 22 months.

If correspondence is to be taken as an index, the doubt respecting the reliability of current dentition tables, to which passing reference has already been made, is widespread and growing; and consequently it was decided that a review of the question was desirable and ought to be made.

Obviously the ideal method of studying dentition is to examine a large collection of living animals at definite intervals from the time of birth to the time when the last permanent tooth is cut. Equally obviously such a method is not practicable unless unlimited time and facilities are available. Instead of examining the same animals periodically, another

¹ Engelberg, K. 'Altersbestimmung des Schweines.' Diss., Leipzig, 1917.

method—that employed by Sir George Brown—is possible—namely, the examination of pigs at shows and elsewhere, notes, and if possible drawings, being made at the time of examination. Admirable though it is, this method has its weaknesses. In the first place reliance has to be placed on the statement of the breeder or exhibitor, who may or may not have a definite and precise record of the day of birth, and who may or may not be concerned more with a desire to convince than to disclose cold facts. In the second place, the personal factor inevitably enters into the making of notes and drawings, however determined one may be to avoid it.

When the present inquiry was entered upon it was decided that neither of the foregoing methods should be adopted, but that photographic records should be made of as many prepared specimens as possible, the great advantage of this procedure being that both specimens and photographs may be consulted and reconsulted as often as wished. At the time of writing about 450 heads have been collected. All of them are from either pure-bred animals or from first crosses. A few of them are from pedigree animals, but most of them are the heads of what may be called the ordinary commercial pig. If it should be objected that pedigree and non-pedigree animals may attain maturity at different ages, the reply is that everyone is seeking early maturity for bacon-making purposes.

Clearly 450 is far too small a number upon which to base definite conclusions, and these notes consequently are not intended to be anything more than introductory. They are to be taken merely as an indication of what is being done and as containing a suggestion that some modification of current dentition tables may ultimately be found necessary. And, though it should not be necessary, it may be added that the investigation now being carried out was not entered upon with the idea that the tables must of necessity be wrong: its purpose is either modification or confirmation, as revealed facts may direct.

As it happens, a considerable number of the specimens already collected are from animals ranging from the 16th to the 40th week (roughly, 4 to 9 months) after birth, a period during which, according to accepted statements, four permanent teeth (namely, the third or 'corner' incisor, the canine, the first premolar, and the first molar) should be cut. In this category 176 specimens have already been prepared, photographed, and compared, with results that will be summarised as briefly as possible. A chart (Fig. 4) has been constructed showing the periods during which the four above-mentioned teeth are appearing in the upper and lower jaws of the Edinburgh specimens; and below this, for comparison, are added those parts of Figs. 2 and 3 (Brown and Sisson)

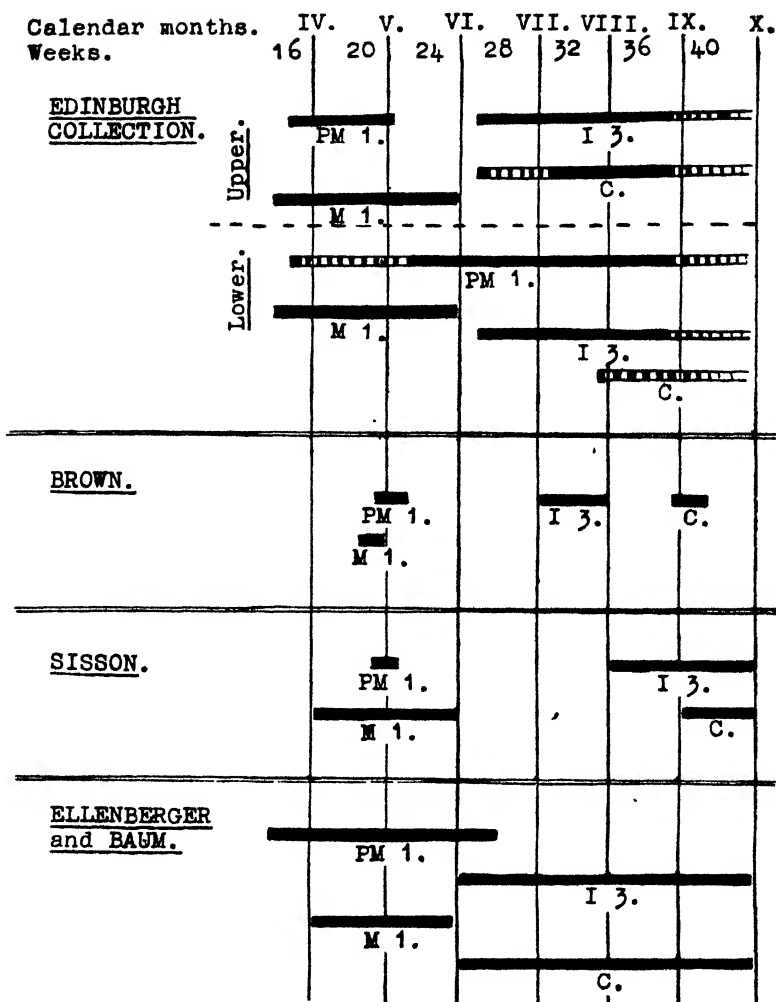


Fig. 4.—Chart to show the periods of eruption of the third incisor, canine, first premolar, and first molar in the *Edinburgh specimen*, as compared with the corresponding periods as stated by other observers.

that are relevant, as well as a chart similarly made by a combination of the early, medium, and late periods as stated by Ellenberger and Baum.

Third (Corner) Incisor (I 3).—In the Edinburgh collection this tooth first appears in specimens from pigs 27½ weeks old, and, so far as material permits of a conclusion, apparently erupts notably earlier in the lower than in the upper jaw of the same animal. Indeed, very seldom has it been found that the eruption of the upper and lower teeth is synchronous; and in only one specimen is the upper tooth present in the absence of the lower.

Comparison with Brown's and Sisson's tables shows that the Edinburgh specimens suggest the possibility of earlier eruption of this tooth than at the time given by either of these authorities. Our specimens rather lend support to the periods of eruption as stated by Ellenberger and Baum. Unfortunately material available at the time of writing does not permit the end of the eruption period to be given with assurance; but there is strong probability that it is somewhere in the neighbourhood of 10 months, in accordance with the statements of other observers.

Canine (C).—The youngest specimen in which the upper tusk is being cut is 27½ weeks old, while the youngest specimen showing eruption of the lower tooth is 34 weeks old. These, so far, are both isolated instances of early eruption, and therefore are only of value as showing what may be the earliest date. Upper canines begin to make a more regular appearance during the 32nd week. Nothing can, as yet, be said of the latest date at which the upper tusk is cut. Nor can anything be stated concerning the lower tooth, except that, apart from the isolated specimen mentioned above, no specimen younger than 40 weeks shows any certain sign of change.

Clearly eruption of the canine tooth is much earlier in the upper than in the lower jaw, and it seems probable that existing British dentition tables require emendation in respect of this tooth.

First Premolar (PM 1).—Of the four teeth at present being considered, it is evident that the *upper* first premolar has the shortest period of eruption. The youngest specimen in which eruption has been observed was aged 16½ weeks, and the oldest 22 weeks. Basing a hazardous conclusion on the material so far examined, it may be said that the period of eruption of this tooth covers about 6 weeks—from slightly less than 4 to slightly more than 5 months of age.

Obviously the *lower* first premolar is of little if any value

as an indicator of age. A single isolated specimen of the age of 16½ weeks has the tooth in process of eruption, but the next oldest specimen to possess the tooth is 23½ weeks old. From this age onwards to 40 weeks (and most probably beyond) eruption may occur apparently at any time. Moreover, we know that the lower first premolar may be absent from the adult dentition.

First Molar (M 1).—The Edinburgh specimens show that the first molar may erupt at any time from 15 to 26 weeks, a period very nearly the same as that given by Sisson and Ellenberger and Baum (4 to 6 months). Brown was evidently well justified in claiming that the appearance of this tooth is 'remarkably regular.'

In the foregoing analysis no mention is made of the possible factors, breed and diet. Information on these has, however, been collected, and their influence (if any) will be disclosed later.

Little difficulty is being experienced in obtaining material of the ages at which pigs are usually killed for bacon-making, but it is evident that there will be considerable trouble in getting a sufficiency of specimens to illustrate the state of the dentition beyond the age of about 9 months. And it may be frankly confessed that the premature publication of notes of observations made up to the present is mainly for the purpose of enlisting the active sympathy of breeders, without which the investigation is bound to be very slow.

ACKNOWLEDGMENTS.

This inquiry was begun under the auspices of the since-deceased Scottish National Association of Pig Breeders, and the initial expenses were covered by grants made by the Highland and Agricultural Society and the National Pig Breeders' Association. Later grants have been made through the Department of Agriculture for Scotland.

Grateful thanks for specimens are due and are here tendered to the Rowett Institute, Aberdeen; the L.C.C. Mental Hospitals Department, and Mr R. H. Curtis, Acting Chief Officer of that Department; Mr F. Beckett, M.R.C.V.S., Blandford; Mr J. Cruickshank, Bangour; Mr R. E. Dorell, Epsom; Mr A. Duckham, Sevenoaks; Mr D. A. Frankcombe, Epsom; Mr A. N. Haig, Kinross; Mr A. Jack, Musselburgh; Colonel Keay, Bangour; Mr R. W. L. M'Caig, Foreside of Cairn; Mr J. M'Clelland, Woodside, Aberdeen; Mr J. D. Paton, Woodside, Aberdeen; Mr T. F. Spencer, Bexley; Mr H. Steele-Bodger, M.R.C.V.S., Tamworth; Mr Ian Stuart, Peterculter; Messrs A. Swinton & Sons, Leadburn; Mr F. S. Wagstaff, Epsom; the Misses Watson, Leeds; Mr F. Whitman, Southall; and Mr George Will and his son, Crichton Royal, Dumfries.

CHEVIOT SHEEP: SOUTH AND NORTH COUNTRY.

By JOHN ROBSON, Jun., Lynegar, Watten.

IN tracing the origin and history of the North and South Country types of Cheviot Sheep, it is easy to give a full account of the North Country breed, as its history is known from the time it was first introduced into the North of Scotland in 1792 down to the present day. Of the South Country or original Border breed, it is more difficult to give any exact account, as a species of sheep appears to have been, from the earliest times, indigenous to the Border Country.

That flocks—which in the eighteenth century were known as the “Long Sheep,” in contrast to the forerunners of the Black-faced Sheep, which were known as the “Short Sheep”—had been kept on the Border hills as far back as the Middle Ages is a well-known fact. Cosmo Innes devotes a whole paragraph to a description of the “Sheep-farming Monks or Churchmen of Teviotdale.”

In the eighteenth year of the reign of King Alexander II. of Scotland (1232) we find mention of one, John of Hawelton, having stolen, along with cattle and horses, 200 wethers and ewes, of the value of twelve pence each, from Wark in North Tyne, and having driven them to Sewingsheids and detained them there.

Again, in the thirty-first year of the same reign, one De Bellingham of Hesleyside lost an arbitration case over the upkeep of ditches and hedges with Nicolas of Plenderleith, Abbot of Jedburgh, who had been given a lease of the grazing of Ealingham by the Scottish king.

In a final settlement the Abbot had to have free access to the Common Pasture of Hesleyside within the open time, for all his flocks of Ealingham, and without the hedges at all times of the year, but the flocks “shall each night be on the East side of Stirkscleugh.”

When one remembers that the inhabitants from both sides of the Border were nearly always fighting or raiding, one gathers there would be little inducement to improve the sheep of these districts; but from the fact that they were thus constantly mixed up, one may surmise that they would be one breed—the Long Breed.

That these raids did not always bring happy results to the perpetrators, and that some of the troubles of the present day were then not unknown, appears from the following, which took place early in the sixteenth century.

The Robsons of North Tyne made a raid on Liddlesdale, which was Graham country, and took back with them a flock of sheep which happened to be infected with scab. The disease spread to their own flocks, and this so incensed the Robsons that they returned, captured and hanged seven of the most substantial Grahams, saying, "The next time gentlemen cam' to tak' sheep, they war no to be scabbit."

It is, therefore, unlikely that until after the '45, when both sides of the Border were finally disarmed, much improvement was effected ; but from that date we have evidence that the Borderers had turned their swords into crooks and attempted to improve their flocks and herds.

In the year 1756 we learn that three Border farmers, Mr Robson of Philhope (he went to Scotch Belford in 1760 and later to Chatto), Mr Charles Kerr of Riccalton, and Mr Edmestoun of Mindrum, brought fourteen tups from Lincolnshire. Whether these were the improved Leicesters of Bakewells, like those their near neighbours, the Culleys, brought from Durham into Northumberland in 1767, or Lincolns, has always been a debateable point ; but in a letter to the 'Farmers' Magazine' in 1803 a writer seems to point to their having been the latter. Signing himself "A Northumberland Farmer," he writes : "As a proof of the fineness of Lincolnshire wool at the period alluded to (1760), I need only observe that the late Mr James Robson of Chatto, a most respectable man and breeder of Cheviot Sheep, who then lived at Scotch Belford, purchased some tups from Mr Mumby, near Barton-upon-Humber, Lines., who at that time stood high as a Lincoln ram breeder. These tups, without injuring the quality of the wool, greatly increased the quantity, and gave Mr Robson such a decided superiority over his hill neighbours that for many years after making the cross he sold more tups than one-half of the other hill farmers."

These facts are not in agreement with Varney's evidence before the House of Lords in 1828, when he states : "Cheviot wool is deteriorated very much in point of hair, and will not make fine clothes now, as it once would. It is coarser and longer, a state attributed to the Cheviot having a partial cross of the Leicester."

Culley, in his 'Observations of Live-stock,' writing about the end of the eighteenth century, says of the Cheviot breed : "Their mutton is excellent, fleece about three pounds, which is in great demand, bringing high prices. The breed has been much improved of late years, though there is still a want of depth in the forequarters and breadth both there and on the

chine." This description would at the present time be much nearer the North Country type, one large flockmaster having recently said: "The difference in the two types was that the South had been improved while the North was the old unimproved type."

However, after the middle of the eighteenth century the breed rapidly improved, so that when that great agricultural improver and first Minister of Agriculture, Sir John Sinclair of Ulbster, examined all the mountain breeds of sheep with a view to increasing the value of his own property in Caithness and the North of Scotland, he decided that the Long Sheep

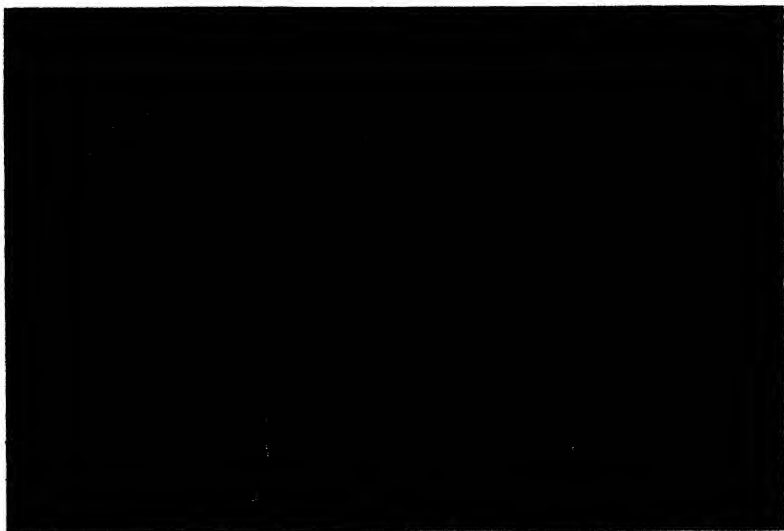


Fig 5.—*Two-shear Ram.*

First, Highland and Agricultural Society Show, Kelso, 1832 Bred by Mr Paterson,
Bighouse, Sutherlandshire

of the Borders answered his purpose best, and called them Cheviots after their native hills. In 1792 he gave an order for 500 draft ewes to be bought for his estate of Berriedale, now owned by the Duke of Portland, and still carrying one of the best flocks in the North.

These sheep did so well that Highland lairds decided to turn their lands into sheep farms, and in order to do so caused numberless crofters to be evicted. They were then able to let large tracts of land to South Country sheep-farmers, who not only brought north with them Border Cheviots but Border shepherds as well. Some of the lairds engaged South countrymen to manage their farms, with the result that the North

was, with few exceptions, stocked with Cheviots. The original sheep, called Kerries, which, according to MacDonald ('Highland and Agricultural Society's Transactions,' 1875), "were small, narrow in the frame, short, very unshapely and slow in growth, the wool and mutton producing qualities very poor indeed," gradually became extinct, the last of the species being seen on a few crofts along the north coast of Caithness.

This change-over from Kerries to Cheviots, which caused much more money to be circulated in the North, was almost entirely brought about by introducing South Country sheep. It was unlike the way the farmers in Ettrick Forest, &c.,



Fig 6 — *First Prize pen of Iwes in 1844*

according to Hogg, changed their native sheep to Cheviots by introducing Cheviot tups till the breed showed all the Cheviot characteristics. Further, it was largely helped by the disastrous years 1806-7, when, owing to rot or Liver Fluke in the North, not only the Kerries but even goats were practically decimated.

Thus, it seems, even nature had some hand in helping on the quick change-over from a practically worthless breed to one which has made a name for itself all over the world where sheep-farming is engaged in.

Considering that the first Cheviots went North only in 1792, and well as they are known to have thriven in their adopted home, they could not have increased from a few

thousands at the commencement of the century to over two hundred thousand in 1820 without a huge number having been taken yearly from the South. In 1820 one grazier sent from Sutherland a hundred thousand fleeces and twenty thousand ewes and wedders.

With these yearly additions from the South there can have been little difference in the types for a number of years. How this difference of type did eventually take place it is difficult to say. Some maintain that the North Country sheep, especially the Caithness type, had another cross of



Fig. 7.—*Two-shear Ram.*

First and Champion, Caithness Show, 1925.

alien blood, Border-Leicester, thus causing the heavy drooping ears and greater size. After the country became stocked with wedders on the high grounds, and ewes on the low grounds, scores of South Country tups were bought at Hawick by Messrs Todd, &c., and afterwards by the late John Murray, and sent North. Since the latter's death it has been the custom of several of the principal sheep-breeders in the North to buy for themselves the best tups at Hawick sales.

It is certain that at the present time there is very little similarity between the two types. Proof that this difference arose during the second half of the nineteenth century may be drawn from the fact that at the Highland and Agricultural

Society's Show at Kelso in 1832, Mr Paterson, Bighouse, Sutherland, successfully exhibited a tup, which was then purchased by a Border breeder and very extensively used by most of the leading breeders on the Cheviot Hills. This fact evidently shows that he had been considered a good example of what a Cheviot tup should be, or his breeder would not have taken what must have been a very tedious and expensive journey, nor would Border breeders have used him so extensively had they not particularly fancied him.

Shortly after this there appears to have arisen a difference



Fig. 8.—*Two-shear Ram.*

Bred by D. Waters, Lochend, Caithness. Winner of First Prize, Caithness Show, 1908.

of type in the South Country itself, the Border breeders sticking to the type produced by the use of the Paterson tup, while in Dumfriesshire, Mr Brydon, who amongst other large farms held Moodlaw and Kinnelhead, began breeding a type, longer and lankier, with open coats, which for a time carried all before them both in show and sale. Mr Brydon's tups were greatly sought after, and at his annual sales at Beattock they fetched big prices, farmers purchasing them from all over Scotland.

In 1867 the late Mr John Miller, Scrabster, Thurso, paid 185 guineas for Craigphadrig, which had been first at the Highland Show that year, and Mr Miller at Broubster and

Mr Paterson at Bighouse used him very extensively along with his sons. From records in the possession of Mr John Miller, Scrabster, of sales at Georgemas, they sold many of his progeny, which were bought to go all over Caithness, Sutherland, Lewis, and Orkney, at what were then high prices. It appears the Brydon sheep were found to be too soft on the Borders, with its severe storms and bare hills, but that they suited the North seems likely, or such prices would not have been paid for them or their progeny.



Fig 9.—*Shearling Ram, "Milknowe Sensation."*

First and reserve Champion, Highland and Agricultural Society Show, Alloa. Bred by John Robson, Esq., Milknowe, Duns, and sold at Hawick, 1920, for £400 to Messrs T. R. Elliot, Altonburn, and John Robson, Jun., Lynegair, Watten.

Perhaps it was the influence of the Brydon sheep which changed the type in the North, or must it be put down to the changed conditions of soil and climate, or solely to selection?

Probably all three have had their share in its development, as it is wonderful what a difference soil and climate makes. Clay subsoil seems to produce heavier sheep and more wool than the bare grassy hills, which in their turn tend to encourage shorter wool and harder hair, while heathery lands keep the wool longer and coarser.

The Lammermoors grow sheep with more bone than the

Borders, and the difference can be seen in the same sheep, if changed, in a year or two, so that it is quite evident a century can make an enormous difference in appearance.

In the South, owing to the very severe winters which came in and after 1879, the soft-coated Brydon sheep were unable to survive. A much smaller, thick-coated, well-haired lamb, having withstood the snow and cold, possibly led South Country breeders into breeding a smaller type than was desirable ; but since the '90's the size has tended to increase, while still retaining the other features.



Fig. 10.—*Cheviot Gimmer, "Lady Dean."*

First and Champion, Highland and Agricultural Society Show, Aberdeen, 1928.

As the breeders of each type should know what suits their own district best, it is evident that the difference has been caused partly by the requirements of each country, and partly by what is the fashionable type in each district.

On the Borders, hardihood, wool, and beauty, along with wide-sprung ribs, good shoulders and gigots, a size which the land will carry, have been the qualities aimed at.

In the North size has been the first consideration.

It is possible that the breeders of both types have erred considerably, the one paying too much attention to style, the other too little. It is certain also that the law of the survival of the fittest has had a great deal to do with the

enormous difference which is now apparent between the two types of sheep.

That in the North a softer sheep will survive can be partly attributed to the climate, which, helped by the proximity to the Gulf Stream, tends to give more equable climatic conditions. In Caithness especially there is the further fact that a very large majority of the flocks are treated in the same way as Half-bred ewes in the South—*i.e.*, from January onwards they get hay, oats, or turnips, while on the Borders ewes only get hay during a severe storm, and never oats or turnips, except that a very few of the lean gimmers receive a little help.

The wintering of the ewe hogs again favours the North, as they are invariably sent to arable ground in August and September. Many go to Ross-shire, and still farther south to Aberdeenshire, where they get aftermath followed by stubbles, young grass, &c., and in February turnips. They return home at the end of March.

On the Borders they are generally kept on a part of their own farm or sent to a hill farm which is taken for hogging. It is certain that the North Country sheep does not succeed on the bare South Country hills, though it does well in fields and on low ground. There it has, during the last decade, made great headway, principally helped by the belief that it is clear of, or less liable to be infected by, scrapie than the Border Cheviot.

When brought South on to good keep, Northern ewes undoubtedly do well, and produce a crop of big Half-bred lambs. As long as they do this they will always have their advocates, if not their admirers.

Those pens of great wether lambs which we see at the Christmas National Fat Stock Shows are almost without exception a cross between the two types—Southern tups and Northern ewes.

In order to have some idea of the different types, let us look at the tup (Fig. 5) bred at Bighouse in 1832, and some of his progeny (Fig. 6).

Fig. 7 is a two-shear North Country tup bred at Berriedale, sold for £56 at Lairg, and, like the Lochend two-shear tup (Fig. 8), a winner at the Caithness County Show. Fig. 9 is a present-day South Country shearling, and Fig. 10 a South Country gimmer.

There is a good demand for North Country lambs, the wedders largely going to Cumberland and Dumfriesshire to be fed. It would be interesting if a comparison, between the North and South, of their weights and age when fat could be obtained.

One large South Country dealer always preferred to have a good proportion of Southern blood in the lambs for the Christmas shows and sales, saying that the Northern Cheviot

did not put on a proper back until after clipping. This dealer was in the habit of buying thousands of sheep from the North.

Fortunately there are to be found buyers who are advocates of both types, so it is difficult to get an unbiassed opinion. In passing, it is interesting to note that for the last seventy years, without a break, the Sandside draft ewes have been bought by the Sproats of Kirkcudbrightshire.

In spite of the way the Southern type of sheep is looked down upon by the North Country breeder, it would be difficult to find any flock without a good admixture of Southern blood in it. One of the reasons a large wool buyer gave for the North Country wool not being so good as it used to be was that there was not more South Country blood used. Further, when flocks were large the owner bought one good tup, and by using his progeny gave to his whole stock a similarity, whereas with the dividing up of the sheep farms into holdings each smallholder bought a tup which was quite possibly a different type from his neighbours', and the result was that very many different kinds of wool came from the North. The wool at one time was more or less similar.

It is also becoming much more difficult to find good tups. Whether the dividing up of large farms, which successive Governments have vied with each other in bringing about, will be advantageous to the country as a whole, time alone will show, but it appears already to be effecting a change in the North Country Cheviot.

In spite of its greater size the North Country sheep grows a lighter fleece than the South Country, which again may be caused by soil and climate, or partly by selection. Until recently, however, it has always (except for a few South Country clips) been well worth about twopence a pound more, although latterly there has been very little difference. Whether this is owing to fashion, or the undoubted fact that there has been improvement in South Country wool and probably deterioration of the North Country kind, it is hard to say ; but it is known that some of the farmers in the South, who sold off their Border type and introduced ewe stock from the North, have found their wool has deteriorated considerably.

As an example of how locality affects the wool, it may be mentioned that, at Hawick tup sale a few years ago, a very large flock owner and wool expert from the Falkland Islands was making an examination of the tups, and on coming to a lot of pure South Country type he opened the wool and at once remarked : " These sheep come from quite another district : the wool is finer." These sheep came from Caithness.

Another wool expert remarks : " North Country wool undoubtedly holds first place and is finer than South. This is, of course, taking an average all over. There are a few South Country clips, and especially one or two in Northumberland,

which are equally as fine and good in colour as any of the North Country ones. Again, there are North Country clips which are being bred away from the pure Cheviot. There appears to be two distinct strains in the North Country sheep. One might be called the original; the other shows a longer and stronger fibre. The wool of the former, or "original" as I have called it, is short and fine, and has a denseness of fibre. It is this quality which has made North Country sheep famous for wool, and which is much sought after by manufacturers of the best Cheviot suitings. The latter is not the original North Country Cheviot. I should say that at some date the sheep growing the stronger fibre was bred through a Half-bred (Border Leicester \times Cheviot), as quite a number of clips show up "breedy." This, no doubt, pays the farmer better from a mutton or lamb point of view, but he will have to take a lower price for his wool.

If farmers could combine the two types and get a longer style of fibre and retain much of the fineness, it would pay them. They would get a heavier fleece, and still keep the size of the sheep and lambs.

South Country wool, like the Northern, varies according to the different land on which the sheep graze, the altitude of the farm, and breed of sheep stocked. On the whole, South Country is a very good commercial wool.

A large manufacturer on the Borders says that North Country wool would spin two counts more than South Country wool. That is to say, if the South spun to 18 "cut," the North would spin to 20 "cut" ("cut" is a Scottish spinner's term for the thickness of the yarn, and means so many threads to the ounce). He was likewise emphatic about the way wool had changed in quality since 1913-14. His cloths were coming up different to-day owing to the wool being coarser. Where Cheviot wool used to spin to 20 "cut" pre-war, it will only spin to 16 "cut" to-day.

The average weight of fleeces is as follows :—

North Country Cheviot ewe, washed	. . . 3 lb.
South Country Cheviot ewe, washed	. . . 3 to 3½ lb.
North Country Cheviot ewe, unwashed	. . . 3½ to 4 lb.
South Country Cheviot ewe, unwashed	. . . 4 to 4½ lb.

As a result many consider wool as only a by-product, and with the high prices given since the war for stock, farmers have probably paid less attention to wool than when lambs and ewes were much lower in value.

One of the main considerations fifty years ago, in keeping tup lambs, was to see that there was no kemp. If there was, however good the lamb looked, he was castrated. Now many think a little coarseness of the brich means a hardier sheep,

and undoubtedly there is more kemp in North Country wool now than used to be the case.

If an analogy were wanted between the two types, as regards shape, one might compare the North Country type to the dairy Shorthorn—long, wider behind than in front, and standing higher; while the South Country type is like the Cruickshank Shorthorn—square, set on short legs, wide, deep, and full of mutton to knee and hock.

We may conclude with the saying of a well-known old shepherd: “I aye think it a pity that thar war na twa breeds of Cheviots—ane for yowes, anither for wedders.”

THE WARBLE FLIES OF CATTLE.

By R. STEWART MACDOUGALL, M.A., D.Sc., F.R.S.E.

THE harm done by these flies and their larvæ was known to the Romans, but there was little exact observation until the Italian naturalist, Vallisnieri, in 1710 and the years that followed, made some study of the subject. We owe something also to De Geer and Reaumur. Towards the end of the eighteenth century and the beginning of the nineteenth, Bracy Clark helped greatly with his published accounts in the 'Transactions' of the Linnæan Society.¹ Later, the subject was put on a sound scientific basis in a monograph by Brauer, an Austrian entomologist, on the Warble and Bot Fly family, this work being published in Vienna in 1863.² There is a constantly growing Continental literature on the Warble Flies, great interest being taken in the subject in Germany, Holland, Denmark, France, Norway, Switzerland. The helpful earlier work of Curtice and Riley in the United States has been continued by other workers, culminating in the intensive observational and experimental work of Bishopp and Laake and their colleagues, while Hadwen in Canada has, in a series of informative papers, cleared away difficulties.

In England, Miss E. A. Ormerod, in the late years of the nineteenth century, collected and distributed, in Pamphlet and Report, much practical information regarding Warble and Bot Flies. In the years preceding the Great War, Carpenter and his colleagues in Ireland did invaluable work on the two Ox-Warble Flies, settling points that had been long in dispute, and amassing a store of information.

The economic importance of Warble Flies was stressed by the Great War, and a Departmental Committee was appointed in 1918 to make observations and carry out experiments. This Committee issued its Report in 1926.³ Last year a strong Committee, called together by the Worshipful Company of Leathersellers, was formed, embracing all interests—farmers', butchers', tanners', hide and leather merchants',—and a more or less national campaign has been undertaken. Experimental work is at present being carried out in a number of widely separated areas in Scotland and England, in the hope that an easy and practical method may be recommended for getting rid

¹ 'Transactions of Linnæan Society.' 1796. Vol. iii.

² 'Monographie der (E-)triden.' By Friedrich Brauer. 1863.

³ Report of the Departmental Committee on Warble Fly Pest. Published by His Majesty's Stationery Office. 1926.

of the pest, or at any rate so reducing the Warble Fly population as to put an end to the widespread damage—direct and indirect—at present caused by the fly and its larvæ. In view of this campaign, and because of the interest taken in the subject by the members of our Society and others, it has been thought a suitable time to bring the story of the Warble Flies up to date with the added new facts of recent years.

GADFLIES.

Old accounts use the term Gadflies for Warble Flies, but although the Warble Flies do cause the cattle to 'gad,' the term is confusing, the name Gadflies being also applied to a different set of flies altogether—viz., the flies of the family Tabanidæ, of which the Cleg is perhaps our best known example. The family differences between the Tabanidæ—known also as Horse Flies or Breeze Flies—and our Warble Flies depend on differences of structure, and this is not the place to detail them fully; there are, however, important and easy-to-understand differences in habit. Thus :—

Tabanidæ.

The adult females have formidable mouth-parts fitted for stabbing and cutting—viz., two dagger-like structures, the epipharynx and the hypopharynx; two lancet-like mandibles; two maxillæ with saw-like edge. All six structures lie in a fleshy sheath called the labium. A short hairy sensitive palp hangs on each side of these. The females visit stock for a meal of blood. (The males may not be blood-suckers, and their mouth-parts are not so formidable.)

The eggs are laid on plants growing in wet places, or in some situation near moist soil or water.

The larvæ live in wet soil or in water, and feed upon grubs, worms, and such animal life as they meet with in their habitat (Fig. 11 and Fig. 12).

Warble Flies.

The mouth-parts of the adult flies of both sexes are vestigial, and without function.

The adult flies cannot feed and they cannot sting—i.e., they are incapable of wounding.

The eggs are laid on the hairs of the host animal, or, in the case of the Sheep Nostril Fly, the maggots are born alive and are deposited in the sheep's nostrils.

The larvæ live in and at the expense of the host animal.

There are three British genera of Bot and Warble Flies—viz., *Gasterophilus*, *Hypoderma*, *Oestrus*. In the older classifi-

cation the habit was to include all three in the family *Cestrinæ*. In the more recent classification the systematists have separated them. *Gasterophilus* has been placed in a family by itself, nearer the *Anthomyids*, and rather separated from *Hypoderma* and *Cestrus*. This need make no difference to our review here as we compare and contrast them in their work and in the habitat of their maggots or larvæ.

The adult flies in all three genera are creatures of the sunshine, fly actively, lay eggs—or larvæ—on the host animals, do not



Fig 11 —*Tabanus sudeticus*
Natural size From nature

sting or bite, never feed as adults, and are completely parasitic in the larval stage. All three—*Gasterophilus*, *Hypoderma*, *Cestrus*,—in spite of absence of mouth-parts that can wound, and absence of sting, may yet cause the host animals to stampede.

Gasterophilus.—This is the genus of Horse Bot Flies, of which there are three species in Britain, the common Horse

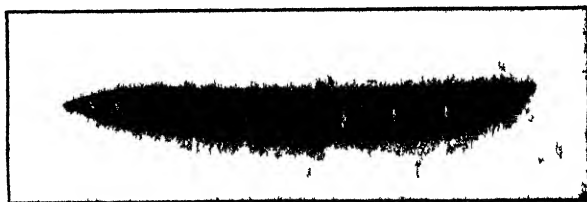


Fig 12 —*Larva of Tabanus biguttatus*¹
From nature Natural size.

Bot Fly (*Gasterophilus intestinalis* or *equi*), the Nose or Red-Tailed Horse Bot (*G. hemorrhoidalis*), and the Throat Horse

¹ *Tabanus biguttatus* is not a British species. It is a large South African species whose larva has been chosen here because of its size.

Bot (*G. nasalis* or *veterinus*). The first is common, the other two very rare, in Britain.

G. intestinalis is a thick-set, hairy, brownish-yellow fly, with wings that have a dark band, and here and there dark spots; it measures from about $\frac{1}{2}$ to $\frac{3}{4}$ inch long. The male has the end of the abdomen rounded; the abdomen of the female has a pointed ovipositor



Fig. 13.—Larvæ of Horse Bot attached to stomach.

Natural size. From nature.

directed downwards and forwards. The eggs are white or yellow-white, $\frac{1}{20}$ inch long, pointed at the attached end, truncate at the free end, which is provided with a lid, whose edge overlaps the egg. The eggs are laid on the hairs of the fore-leg, sometimes on the mane and on the sides. The egg fits over the hair by its hind two-thirds, and is firmly fixed by a secretion from the accessory glands of the female. Friction (of the horse's tongue) and moisture are necessary for hatching. The larvæ on hatching are taken into the mouth

when the horse licks itself, and ultimately reach the stomach,¹ where they fix themselves by their prominent mouth-hooks (Fig. 13); here they remain for nine to ten months. When full-grown (Fig. 14) the larvæ leave go, and passing along the alimentary canal fall away with the droppings, and so reaching the soil, where they pupate. The fly comes away in six weeks.

G. hæmorrhoidalis.—As far as I know there is only one record of the adult of this fly for Scotland, and extremely few for England. This is a blackish fly, smaller than the last; the wings are clear, the body ends in reddish-orange hairs. The eggs have a prominent grooved stalk by which, and by the lip or flange-like edges of the shell, they are fixed to the hairs round the horse's lips. The larvæ fix themselves to the stomach, the first part of the small intestine, and later to the rectum and anus.

G. nasalis.—The fly is blackish, with orange-red hairs on the upper surface of the thorax; the abdomen is black, and ends in greyish hairs; amid white hairs on the upper surface of the abdomen is a conspicuous dark band. The female lays her eggs on the hairs of the lower jaw, and when the fly is about, horses may be seen protecting themselves against egg-laying by standing together and resting their heads on each other's backs. The egg has no stalk; it is so fitted over the hair that only a small part at the anterior end of the egg is free.

An additional feature of interest concerning the genus *Gasterophilus* is that first-stage larvæ have been taken from the skin of human beings.



Fig. 14 —*Larva of Gasterophilus intestinalis (equi)*

Greatly magnified

Note the mouth hooks by which the larva maintains its hold, the strong spines on the various joints, and the hind spiracles which have been flattened out to bring them into the photograph

¹ We have no exact knowledge as to how the larvæ of this and the two other species of *Horse Bot* reach the stomach.

THE SHEEP NOSTRIL FLY OR NASAL BOT FLY
(*Oestrus ovis*).

This fly comes nearer in relationship to the Warble Flies of cattle (*Hypoderma*) than *Gasterophilus*. The fly measures about $\frac{1}{2}$ inch in length; it is greyish or dark-grey in colour, with light and dark spotting; the head is broad and the eyes are small and far apart; the wings are glassy.

The eggs hatch in the body of the female, and the small larvæ are deposited in the sheep's nostril in a milky fluid. The larvæ climb up the sheep's nostril, causing great irritation to the sheep, and ultimately fix themselves by strong mouth-hooks at the top of the nostril and in the sinuses of the forehead; they do not and cannot penetrate to the brain. The larva measures when full grown $\frac{3}{4}$ inch; when its growth is complete, it leaves the nostril, being sneezed out on to the pasture. Pupation follows in the surface layers of the soil.

Sheep fear this enemy. Bracy Clark¹ describes the happening. "The moment the fly touches the nose of the sheep, the sheep shake their heads and strike the ground violently with their fore-feet. At the same time, holding their noses close to the earth, they run away, looking about them on every side to see if the fly pursues; they also smell to the grass as they go lest a fly should be lying in wait for them. If they observe a fly, they gallop back or take some other direction. They have recourse to a rut, dry dusty road, or gravel pits, where they crowd together during the heat of the day, with their noses held close to the ground, which renders it difficult for the fly to get conveniently at the nostril."

Abroad there are a number of recorded cases of small first-stage larvæ of *Oestrus ovis* being found in the human eye, the fly having deposited them in or near the eye.

THE HYPODERMA FLIES.

Restricting the Warble Flies to two genera—*Hypoderma* and *Cedemagena*,—we may describe them as large bee-like flies with hairy bodies, whose larvæ are parasitic in cattle, deer of different kinds, goat and antelope, and these larvæ in their latest stages are found in swellings or warbles underneath the skin. We have nothing to do with *Cedemagena* in this article beyond saying for completeness that *O. tarandi* is the Warble Fly of the reindeer, a native of Lapland and North America. Now and again we get the larvæ from reindeer in Zoological Gardens. Carpenter has taken the larvæ from reindeer in the Dublin Zoological Garden. They

¹ 'Transactions of Linnæan Society.' 1797.

have come to me from reindeer in the London Zoological Garden, and in 1923 I recorded the larvæ from reindeer in the Edinburgh Zoological Garden.

There are three *Hypoderma* species in Scotland—*H. bovis* and *H. lineatum*, parasitic on cattle, and *H. diana* (Fig. 15), the cause of warbles on the red deer.

Hypoderma bovis (Fig. 16) measures just over $\frac{1}{2}$ inch in length, and at first sight suggests a bee (young people on being shown the fly have their eye caught by the hairiness and the colour, and at once call the fly a bee). There are only traces of mouth-parts, so that the adults cannot feed or bite or wound; neither can they sting; this is also true of *H. lineatum*. The larvæ of these two flies are so well fed that they store a sufficiency of reserve



Fig 15 — *Hypoderma diana* × 2
From nature



Fig 16 — *Hypoderma bovis* × 2
From nature

to last over the pupal and adult stages, sufficient even for the females to produce their eggs. The fact that the adult cannot feed means that the adult flies do not have a long life.

The face and head of *H. bovis* are yellowish; the front part of the thorax is covered with yellow hairs; the part behind this is black; the hindmost part of the thorax is also black, but in front of the black is a band of yellow hairs. The two flying wings have a brownish appearance, the veins being dark brown; the fourth longitudinal vein in the latter part of its course across the wing bends up towards the third longitudinal (so also in *H. lineatum*). The hairy abdomen is yellow or yellow-white in front, black in the middle, and orange-yellow at the tip. The legs are dark in colour, with the feet paler. The female has an ovipositor or egg-laying organ, which is made up of several of the hind segments of her abdomen telescoped into one another;

this ovipositor is adapted for laying eggs, but is quite unfitted for piercing. *H. lineatum* has a similar ovipositor.

Hypoderma lineatum (Fig. 17) is slightly smaller than *H. bovis*. About the middle of the upper surface of the thorax are four conspicuous, longitudinal, dark lines. Hadwen¹ gives as a characteristic difference that *H. bovis* has "clean legs with comparatively few hairs, whereas the legs of *lineatum* are rougher and more hairy, especially the tarsi or feet."

Egg.—The eggs are narrow and elongate-oval; they are dull white in colour, and the egg-shell is smooth. The egg is provided with a stalk or foot which is grooved; the groove fits over the hair, helping to clasp the egg to the hair (Fig. 18). The grooved stalk to the egg of *lineatum* (Fig. 19) is a little longer and narrower than in *bovis*, but Bishopp² gives as the most striking difference that in *H. lineatum* the attachment of the stalk "is on the side of the base of the egg away from the hair, whereas with *H. bovis* the attachment is more nearly in the middle of the base." The eggs of *H. bovis* are laid singly on a hair, while the eggs of *H. lineatum* are several together in a row on the same hair (Figs. 18 and 19), a very helpful distinction.



Fig. 17.—*Hypoderma lineatum* × 2.

From nature.

The Larva.—In the course of the growth of the larva from the time of hatching until its final stage is attained, several moults take place, dividing the larval life into stages or instars. It is very difficult to make sure of the number of moults in dealing with these larvæ, which spend their lives internally in the host animal, disappearing into the skin at once on hatching, and never showing again for months, when the larva reappears in the skin of the back. There is no doubt about there being at least four larval stages with recognisable differences. Laake³ in the United States has described five stages and four moults. It may be so, but in spite of Laake's toilsome work and most helpful tables of differences, I am not absolutely convinced that there are five stages.

¹ "A Further Contribution to the Biology of *Hypoderma lineatum*." By Seymour Hadwen, D.V.Sc. Dep. of Agric Bulletin, Scientific Series, No. 21.

² "The Cattle Grubs or Ox Warbles, their biologies and suggestions for control." By F. C. Bishopp, E. W. Laake, Brundrett, and Wells. United States Department of Agriculture. Bulletin No. 1369.

³ "Distinguishing Characters of the Larval Stages of the Ox Warbles." By E. W. Laake, in 'Journal of Agricultural Research.' Vol. xxi. 1921.

I am buttressed in my opinion by an intensive set of measurements of mouth-hooks and cephalo-pharyngeal skeleton made in my laboratory by Mr J. W. M'Hardy, B.Sc., from a large series of larvæ taken from infested gullets. Further, Laake's third-stage larva is distinguished by the term 'spineless' (spines, though present at the anterior and posterior ends, are said to be absent from segments 2 to 10), but Mr M'Hardy in some microscopic preparations on loan from Carpenter found one containing fourth-stage (Laake's fourth stage) spiracle rudiments as well as third-stage (Laake's third stage) spiracles; the larva had been ready to moult to the fourth stage, and yet it was spined on the body segments in the definite arrangement typical of Laake's second stage.¹

The number of larval stages is interesting from the academic standpoint, but is too technical for the general reader. I shall then, as regards the larva, confine myself to remarks on the newly hatched larva, the second-last-stage larva, and the last-stage larva, these being stages concerning which there is no disagreement.

The newly hatched first-stage larva (Fig. 20) has special features that have been described in various researches by Carpenter, Continental workers, and by Bishopp and Laake. Glaser and Carpenter were the first workers to obtain the first-stage larva of *bovis* in the free state. In both *H. bovis* and *H. lineatum* the larva from the egg is markedly spiny, the spines on the hind joint being larger. The mouth apparatus consists of cutting mouth-hooks and two supporting pharyngeal rods; from between the mouth-hooks a spine projects suitable for piercing and boring through the tissues. This type of cutting and piercing mouth-parts persists in the various stages of larvæ that wander through the tissues and



Fig 18 —*Larva* of *Hypoderma bovis*
From nature Greatly magnified.

¹ "Further Observations on the Moults of the Ox Bots, *H. bovis* and *H. lineatum*." By E W Laake, in 'Journal of Agricultural Research' Vol. xxviii. April 1924.

finally to the skin of the back. The larva on reaching the back cuts a hole through the skin to the outside, and soon moults, giving place to the second-last-stage larva, which is more or less spiny, but has feeble mouth armature.

The second-last-stage larva of *H. lineatum* and of *H. bovis* can easily be distinguished if a preparation be made of the

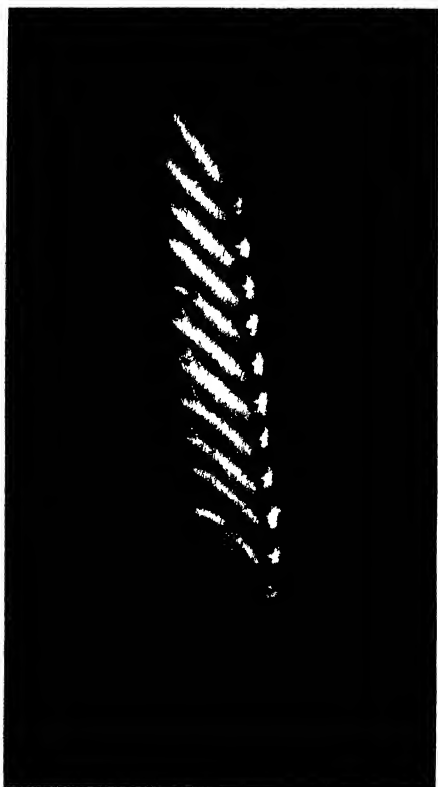


Fig. 19. —Eggs of *Hypoderma lineatum* attached to hair of cow.

Five of the eggs have hatched and six are unhatched. Magnified 15 times. By the courtesy of Professor Carpenter.



Fig. 20 —First-stage larva of *Hypoderma bovis*.

From nature. Greatly magnified.

spiracles which are on the hind face of the last joint. Fig. 21 shows these spiracles in *H. lineatum* and Fig. 22 shows them in *H. bovis*. Fig. 23 shows the hind spiracles (the dark central areas) of a second-last-stage larva about to moult.

In *H. lineatum* the respiratory area shows a number of little discs or circles which typically are less in number than the corresponding discs in *bovis*, and further, the discs are

much] easier to count owing to their greater separation from one another. In *H. bovis* the discs or circles are more or less



Fig. 21.—*Hind spiracles of second last-stage larva of Hypoderma lineatum.*

From nature Magnified.



Fig. 22.—*Hind spiracles of second-last-stage larva of Hypoderma bovis.*

In this preparation for the microscope the spiracles of the second-last-stage larva are about to be moulted off and replaced by the spiracles of the last stage larva; the outline of the last-stage spiracles is seen right and left of the second-last-stage spiracles. From nature. Magnified.

joined to one another, and the respiratory area is much darker in colour; the rims of the discs are rather thicker, and their lumen or enclosed area may be a shade smaller.



Fig. 23.—*Hind spiracles of second-last-stage larva of Hypoderma lineatum.*

When this preparation was made for microscopic examination the second last-stage larva was full grown and about to moult. The micro-photograph shows the large spiracles of the final-stage larva ready to come into function when the second-last-stage larva had moulted, and in moulting had moulted off its spiracles.



Fig. 24.—*Final-stage Hypoderma bovis larva.*

Natural size. From nature.

The number of discs in the spiracles of both *lineatum* and *bovis* varies much, and the number may vary even as regards the right and left respiratory areas of the same larva. Out of 44 counts made by me in the case of *H. lineatum*, the lowest numbers of discs or circles were 9, 10, 13, 14, each once, and the highest number 35 (found twice). Out of 60 counts in the case of *H. bovis*, the lowest was 20 discs or circles (found once), also once 22 and once 23; the highest number obtained was 45.

The final-stage larva is well known; it is the one generally described in the books. Figs. 24 and 25 show these last-stage larvæ.



Fig. 25.—Final stage *Hypoderma lineatum* larva, in the beginning of the instar.

Natural size. From nature

Both larvæ immediately after the moult are white or cream-

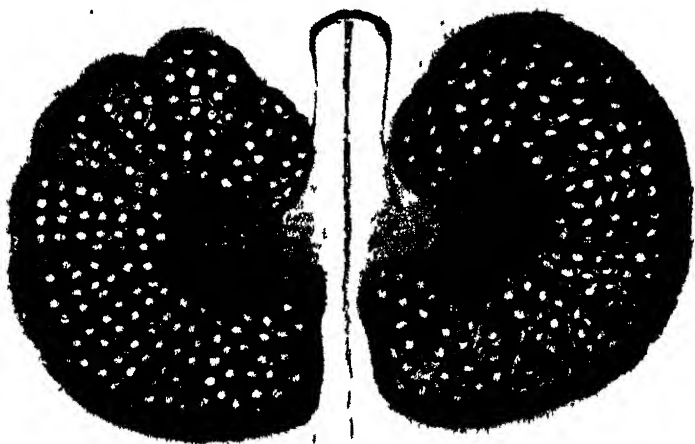


Fig. 26.—Spiracles of last-stage larva of *Hypoderma lineatum*.

Drawn from nature. Magnified.

coloured, but as the days pass they gradually darken to brownish and black-brown. The stigmal-plates immediately

after the moult which reveals them, are pale orange-coloured, but they gradually darken from outside inwards.

The full grown last-stage larva has a tough covering; the head end is poorly developed, and the mouth armature more feeble even than in the previous stage—i.e., no mouth-hooks or supporting pharyngeal rods are to be found. There is a

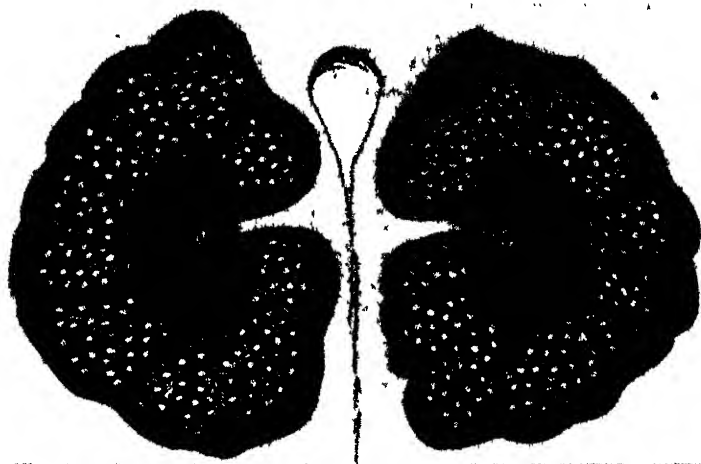


Fig 27 — *Spiracles of last-stage larva of Hypoderma bovis*

Drawn from nature. Magnified

very evident armature of spines on the edges of the segments; the hind stigmal or respiratory plates are prominent (Figs. 26 and 27). The two larvæ in this last stage are easy to distinguish, thus:—

H. lineatum.

Stigmal plates somewhat kidney-shaped.

The surface of the stigmal plates level, or almost level.

The open part of the two C's wider.

Armature more prominent, especially on the under (the convex) surface.

Under surface of joint in front of the spiracle-bearing joint, with armature of spines.

Somewhat thinner, and more pointed at the ends.

H. bovis.

Stigmal plates ear-like.

The surface of the stigmal plates with the centre depressed—i.e., the surface is funnel-like.

The corresponding spaces narrower.

Not so spiny.

No spines on this second last joint.

Somewhat barrel-shaped, and thicker in proportion to its length.

The Puparium or Pupal Case.—This consists of the last-moulted skin of the full-fed larva. This moulted skin, under cover of which pupation takes place and the future fly develops, retains externally the general appearance of the preceding larva—that is, the old segmentation or jointing of the body



Fig 28 —*Puparium of H. bovis from which the adult fly has issued.*
Enlarged from nature.

is evident, and the shape of the moulted-off hind spiracles is the same. The puparium, however, becomes quite black, and the head end narrows somewhat (Figs. 28 and 29). At the head or narrower end is a line of weakness, which will give way when the fly, desirous of getting out, pushes against it by means of a tense projection from its forehead. A more or less round opening is left when the head end of the puparium is pushed off, and the fly walks out (Fig. 28).

THE ADULT FLIES AND THEIR HABITS.

When the fly comes from the pupal-case its wings are unspread, but by half an hour the wings have expanded, body parts have dried and hardened, and flying is being tried. Reproductive organs and eggs are already ripe. Mating takes place at once, followed by the laying of the fertilised eggs.

The flies do not feed and cannot sting. The buzz or hum of the fly in its flight is not loud, but can be heard. Bishopp¹



Fig 29.—*Puparium of Hypoderma diana* $\times 2$

¹ "The Cattle Grubs or Ox Warbles, their biologies and suggestions for control." By F. C. Bishopp, E. W. Laake, H. M. Brundrett, and R. W. Wells. United States Department of Agriculture, Bulletin No 1369.

speaks of the "listening attitude" of cattle when the fly is in their vicinity.

The females are persistent in their egg-laying, chasing the cattle, if necessary, in order to settle and lay their eggs on the hairs. *H. bovis* is more worrying to the cattle than *lineatum*. The persistency of the flies, their come and go in their egg-laying, the hum, the instinctive dread, all help to irritate the cattle, and cause running and stampeding. The cattle may show increased sensitiveness as the season goes on, on account of irritation due to the boring into the skin of newly-hatched maggots from eggs that have been laid on the hairs. Cattle also see the flies, and kick at them as they come to lay the eggs, and they also switch their tails. *H. bovis* lays one egg to a hair and near to the skin; *H. lineatum* lays several eggs in a row on the same hair (Figs. 18 and 19). In conditions that favour the fly, as many as five hundred eggs may be laid by a single female. Many larvæ, however, fail to complete their development. In addition to eggs not hatching, there is considerable mortality of larvæ after hatching, and in the various larval stages in the cattle, including the final stage.

The flies prefer sunny warm weather for their egg-laying; they dislike wet and high wind. They dislike dense shade, hence cattle are safe from the fly's onset if they can reach a covered shed. The flies will not follow cattle into and over water; cattle have been found to stand in water for hours (when they should have been feeding) to escape the fly.

The flies have a short life; their only business is mating and egg-laying. As stated above, they mate as soon as they meet after issuing from the pupal-case; and egg-laying follows at once. As a high number of eggs can be laid in a day, if weather and temperature conditions be favourable, the life of the fly is soon over.

THE HOSTS OF *H. lineatum* AND *H. bovis*.

Cattle are the typical hosts of *lineatum* and *bovis*, and cattle of all breeds. Now and again I hear it said that Highland cattle are not attacked because the hide and underlying muscle are too thick for the larva to cut through. This is an erroneous opinion, as a case from my notes will show. Highland cattle belonging to Mr W. J. L. M'Ewen, in the Isle of Muck, were examined between March and April 30:—

Number of Warbled Highland Cattle.	Age.	Warbles extracted.
16	1 year old	103
8	2 years old	184

In Muck the cattle had access to the sea, and on hot days waded in to avoid the flies.

In America the bison (a close relative of the ox) is also a host animal.

Occurrences in other hosts are more or less accidental. There are fairly numerous records of presence of the larvæ in man. Larvæ have been taken from the skin of the face of children, in Scotland. Bishopp and his colleagues give cases of extraction of *lineatum* larvæ from the neck and shoulder of children; Henricksen took a *bovis* larva from the arm of a boy; and Schöyen, writing in Norway, records *bovis* larvæ from men who had been in constant contact with cattle; the swellings were on head, neck, and shoulders. Then there is the case recorded by Glaser, a well-known worker on Hypoderma, as happening to himself. While Glaser was experimenting with *lineatum* in the month of June, a female laid eggs on his clothing. The larva on hatching entered Glaser's leg, a red spot marking the place of entry. The larva disappeared, but continued to work upwards, and on 2nd October the larva showed itself at the back of Glaser's throat, and was removed. The larva on examination measured just over $\frac{1}{2}$ inch, a common size for larvæ found in the gullet of the ox.

Records of the presence of Hypoderma larvæ in horses are not infrequent, cases occurring both in Britain and America. Walton reports cases on horses in Wales.

Whether sheep are ever attacked in nature is doubtful. Bishopp and his colleagues, in experiment, with eggs laid on the leg of the sheep, had only two or three cases of hatching and penetration of the larva, and a very large number of failures. Out of a number of young *lineatum* larvæ taken from a cow's gullet and introduced under the skin of the sheep, some, later on, reached the skin of the back, but none completed their development.

In India *Hypoderma crossii* is the Warble Fly of the goat. Bishopp and his colleagues in the United States experimented with *lineatum* eggs placed on the Angora goat, and with *lineatum* larvæ taken from the gullet of cattle and introduced under the skin of the goat between the knee and the hip; in a few cases larvæ appeared in swellings on the back of the goat.

DISTRIBUTION OF *H. lineatum* AND *H. bovis* IN SCOTLAND.

Speaking generally from my notes of past years, Hypoderma larvæ have been found from Shetland to Wigtown. *H. lineatum* is earlier than *bovis*, as shown by the following records from my notes over a season. The figures relate to final stage larvæ :—

Date.	<i>H. lineatum.</i>	<i>H. bovis.</i>
March 10	99	0
„ 12 to 20	201	0
„ 22 to 30	451	0
April 2 to 5	172	0
„ 6	23	1
„ 7 to 9	165	6
„ 10 to 14	47	8
„ 15 and 16	86	15
„ 17 and 18	102	9
„ 19 to 21	131	51
„ 22 to 25	106	66
„ 26 to 30	70	211
May 1 to 10	77	209
„ 11 and 12	15	134
„ 13 to 18	0	107
„ 20 to 24	1	104
„ 24 to 30	0	74
June 1 to 9	0	28

There is overlapping of the flight periods of the two species of Warble Fly and also some variation. For example, in one season I obtained second-last-stage larvæ of *H. lineatum* from 2nd March right through April and on to 18th May, while throughout April and May I was also getting second-last-stage larvæ of *bovis*. Roughly, however, one may, in a favourable year for the flies, find *lineatum* in flight in May, while *bovis* comes later. This prolonged flight period is unfortunate for the farmer, for, practising the method of fighting the pest in its final larval stage, the dressing as directed against this larva must be repeated four times in the season. The work of treating the final-stage larva as a method of fighting the pest would be onerous in the beginning, but in succeeding years, with the treatment general, would become lighter and lighter.

LIFE-HISTORY OF *H. lineatum* AND *H. bovis*.

The life-cycle is an annual one—one generation is a year—the greater part of this time being spent as larva in the host animal, for a number of months to begin with internally, and later, in a chamber or cyst in the back, this chamber communicating with the outside by an air-hole in the skin.

For simplicity in description, and to prevent confusion, we will adopt, in this account, Laake's view that the larva has five stages in its life. Part of the third stage and the whole of the fourth and fifth stages are passed below the skin of the back; the common place is in a region, along the back, a little way on each side from the backbone.

The third-stage larva is rarely seen under the skin. I have

found it on three occasions after it had made the hole in the skin to the outside. This third-stage larva moults very soon after reaching the back. I have taken numbers of fourth-stage larvæ, and the fifth-stage larva is the form so familiar to farmer, butcher, and hide merchant.

Our present knowledge of the life-history of these Warble Flies—not yet complete—has been built up as the result of study and observation by many workers, and in the course of years there have been varying and conflicting views. We offer here the life-history, which, as a result of research, may be taken as now representing the belief of workers in this field of science. Probably we are surest of *H. lineatum*, but as we know that, in the main, the two species agree in life-history, we shall describe them as one, protecting ourselves by calling attention to possible differences.

The first flies come from their pupal-cases, in the soil or in shelter-places on the ground, in early summer and throughout summer. Pairing takes place and the fertilised female proceeds to her egg-laying, the eggs being attached to the hairs of the host (Figs. 18 and 19). The commonest place for the eggs is on the legs. Curtice and Riley as far back as 1892 stated that *lineatum* had a preference for round the heel and also the flanks. Glaser confirmed this. Bishopp and his colleagues state that *lineatum* approaches the animal more stealthily than *bovis*. The female sometimes alights directly on the heel, usually below the dew-claws, and immediately extending her ovipositor, grasps the hair and fixes her eggs. Again both Hadwen¹ and Bishopp² have observed *lineatum* backing towards the heel of a standing animal; then while still remaining on the ground, the female *lineatum* extended her ovipositor, reached the projecting hairs, and laid her eggs. The same observers have found *lineatum* laying eggs on different parts of animals that were lying down.

H. bovis approaches more boldly, and worries the beasts more. Glaser and Carpenter found that *bovis* lays on the legs, not confining herself to any particular part, but showing a distinct preference for the heel or hock-joint of the hind limbs. Mote³ has observed *H. bovis* to strike animals in the following places: "side of abdomen, region of rear heel, fore-leg, rear leg, region of rump, under side of abdomen, outer thigh, and left fore-leg just above knee." All observers are in agreement that *H. bovis* worries cattle more than *lineatum*, and this is partly due to the persistent come and go of *bovis*, which lays only one egg to a hair.

¹ "A Further Contribution on the Biology of *H. lineatum*." Bulletin No. 21. Department of Agriculture, Health of Animals Branch, Canada. 1916.

² Bulletin No. 1369 already cited.

³ "The Ox Warble Flies." By Don. C. Mote. Ohio Experiment Station Bulletin 428.

The eggs hatch in a few days. The larva pierces the shell by striking the front part of the egg with the median spine (Fig. 20), and then widening the slit by means of its cutting or tearing mouth-hooks, it leaves the egg by the aid of the backwards-directed spines of the body. The larva then crawls down to the base of the hair and cuts its way into and under the skin, not to be visible again from the outside until months later, when it has reached the back.

The wounds due to the entry of the minute maggots are painful, as indicated by the affected animal shaking the foot, and nosing and licking the places that are reachable. Carpenter, Hewitt, and Reddin¹ have described the entry to the skin of the newly-hatched larva of *lineatum*; with *lineatum* larvæ the wounded places are more marked and more sensitive because a number of *lineatum* eggs being on the same hair the entry places of the larvæ are closer and more together than in *bovis*. Hadwen² has given a detailed account of these lesions, of the exudate from them, of the pimples and temporary small scabs that result, and of the post-mortem appearance of hide and underlying flesh at the places of invasion in animals killed at the time.

The larvæ having entered the skin, in time reach the gullet. Fig. 30 shows the young larvæ in the gullet. December, January, and February are not uncommon months for the larvæ in the gullet, but they are found both earlier and later. A series of gullets dissected in my laboratory by Mr J. W. M'Hardy yielded many larvæ, from one up to thirty-four in a single gullet.³ The usual station for these young larvæ was the sub-mucous coat of the gullet between the mucosa and the muscular coat; the outward and visible sign of the presence of a larva was an inflammatory infiltration in the neighbourhood. After resting, and moving here and there in the gullet, the larvæ wander to and reach the skin of the back. It is Laake's third-stage larva which leaves the gullet and reaches the back and makes the hole in the skin. In one case where such a larva was removed from the back by Mr M'Hardy, it proved about to moult, and a microscopic preparation showed the spiracles of the fourth or next stage larva under cover of the soon-to-be-moulted skin of the third-stage larva. There is some swelling and soreness at the places where these third-stage larva have reached the back, and the opening to the outside may be marked by blood points.

Two further stages—Laake's fourth and fifth-stage larvæ—

¹ "Fourth Report on Warble Flies." 'Journal Dept. Agric. Technical Instruction, Ireland.' Vol. xv. By G. H. Carpenter, T. R. Hewitt, and T. K. Reddin.

² Bulletin 21 previously cited.

³ All these larvæ in the gullet were *lineatum* larvæ, and this will be commented on later.

are passed in the back, but the larvæ of these two last stages do not bore and do not move about. A cyst, whose wall gradually thickens, forms round the larva (Fig. 31), and in this chamber, with its opening to the outside, the larva in its last two stages completes its growth. The position of the larva in the cyst is more or less horizontal, with the hind spiracles arranged at the opening for the taking in of fresh air. In these last stages

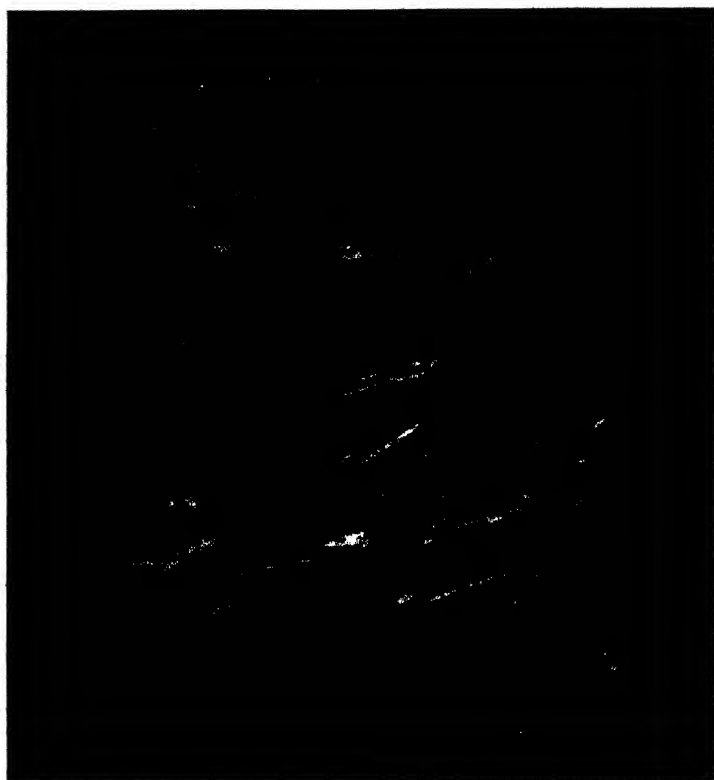


Fig. 30.—Early stage larvæ of *Hypoderma lineatum* in gullet of ox.

Natural size. From nature.

the larvæ feed on the products of the inflammation induced by their spines and their muscular contractions.

There is no month in the year in Scotland in which Hypoderma larvæ cannot be obtained in the skin of cattle, although at certain times of the year one must have access to the hides of slaughtered animals. From February till the end of May the presence of the larvæ under the skin of the back of infested animals is easy to tell by touch and the eye, but

in January, June, and July one can also find examples in the living animal. To take one year's observations from my notes; after field observations till the middle of June, I had access to the hides of slaughtered animals, and found larvæ right on to August, when I had to go abroad. Every day in June, except one, larvæ were obtained. Sporadically

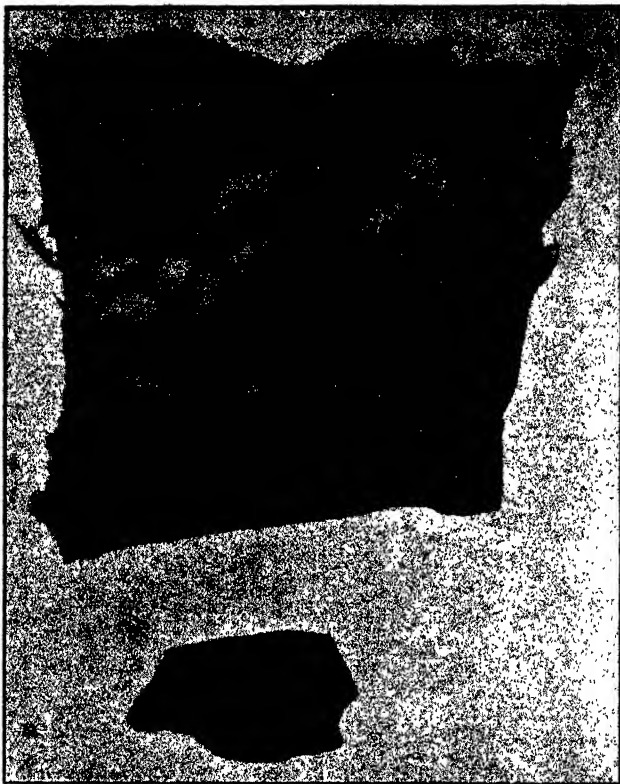


Fig. 81.—Under side of hide of ox, showing warble cysts, each of which contains a larva of *Hypoderma lineatum*.

In the lower figure a cyst has been opened, and a larva has been exposed.
From nature. Reduced.

throughout July larvæ were found. My last recorded observation was 9th August, when I removed for examination a larva which proved to be that of *H. bovis* in an early period of its last stage.

The fourth larval stage lasts about a month, the fifth larval stage six weeks, or a little less or a little more.

The full-grown larva, with tough outer covering and its bands of spines, presses itself out of the opening of the warble,

this requiring considerable muscular effort, and drops to the ground. Seeking a place of shelter under litter, or entering the surface layers of the soil, the larva, after a very short quiescent period, moults its last skin. This is not thrown away, but remains as a case or puparium, under cover of which the fly develops to the adult stage. The puparium



Fig 32 — *Under side of hide of deer, showing warbles, each of which contains the larva of Hypoderma diana.*

From nature. Reduced.

is hard and black (Figs. 28 and 29). In about six weeks the fly is ready, and issues by pushing off the front end of the puparium.

COMMENTS ON AND ADDENDA TO THE FOREGOING LIFE-HISTORY.

- (a) The eggs are *not* laid below the skin.
- (b) As a result of experiment and observation, it can be stated emphatically that the chosen place for egg-laying is *not* on the hairs of the back.
- (c) Following the lead of America as regards *lineatum*, nearly all believed that the larvæ gained entry to the gullet by way of the mouth, that the larvæ hatching from eggs laid on the hairs of the leg were conveyed to the mouth by the tongue when the beast licked itself, and so directly to the gullet. Koorevaar¹ almost

¹ "De Larvetvoistand van *Hypoderma bovis*." By P. Koorevaar, in 'Tijdschrift der Nederlandische Dierkundige Vereeniging,' 1898. Translated by Austin in 'Ann. Mag. Nat. Hist.' Ser. 7. Vol. iv. 1899.

alone held to the view that the newly-hatched larvæ entered the skin at once. Experimental and observational evidence by Carpenter and his colleagues, Hadwen, and Bishopp and his colleagues, prove Koorevaar to have been right, and it is accepted that the larvæ enter the skin directly and proceed to the gullet. This long way from the heels of the animal to the gullet has puzzled many and the fact has not been readily accepted. Some idea of the nature of the experiments may be gleaned if we say that calves kept muzzled during the fly season, so that the licking of the larva was impossible, and allowed freedom otherwise, alongside of controls, showed more Hypoderma larvæ in their backs than the unmuzzled controls did. Again, numbers of newly-hatched larvæ were introduced into the mouths of experimental animals, and no warbles resulted. Again, larvæ hatched in an incubator, and then placed on short-cut hairs of an animal, were watched and seen to enter the skin. The lesions mentioned earlier also afford proof of direct entry. The larva in this stage is very tiny, and so it is no surprise that the complete path or route from skin of leg to gullet has not been traced. Stub¹ of Copenhagen, however, has supplied helpful information. I have not seen Stub's paper, and so I quote from Bishopp's account: "In a post-mortem, Stub observed an infiltrated area in the superficial connective tissue on the inside of the right tibia, and succeeded in following the track over the shoulder around the muscles of the neck to the tissue on the gullet, where it enters the thoracic cavity. Here he found a number of larvæ in close proximity, and measuring just over $\frac{1}{16}$ inch in length."

- (d) Almost without exception the larvæ found in the gullet, and tested by Laake's microscopic points of distinction, have been those of *lineatum*. In our own work 186 Hypoderma larvæ were removed from gullets, and, after microscopic examination by Mr M'Hardy, all proved to be young *lineatum*. Larvæ to the number of 1140—an impressive number—removed in a year,² and examined by Bishopp and his colleagues, proved with one exception—an *H. bovis*—to be *lineatum* in early stage. The inference is that *H. bovis* differs from *lineatum* in this detail of the life-history. Where young *bovis* tarries on its way to the back after entering the skin is a secret not yet extorted from nature.

¹ "Bidragtil Oksebrensens Biologi." In 'Maanedsskr. Dyrlaeger.' Vol. 24. 1912.

² Bulletin 1869, already cited.

- (e) Hadwen¹ offers two interesting reasons for the gullet being a helpful place of stay for young larvæ—viz., that the connective tissue between the mucous and muscular layers allows of easy movement and thus prevents encystment, and that in the gullet there is little reaction against the parasite.
- (f) The exact route of the *lineatum* larvæ from the gullet to the back is difficult to define. Doubtless the final position is reached by different roads—e.g., by the diaphragm or by the spinal canal. Hadwen² suggests a gradual working towards the diaphragm end of the gullet, then across the diaphragm to follow the ribs in the neighbourhood. The larva next passes between the intercostal muscles, reaches the upper part of the intercostal space, enters the spinal canal through the posterior foramen, and finally reaches the skin of the back. Or perhaps the larvæ on leaving the gullet pass through the pillars of the diaphragm on their way to the spinal cord, thence later “through the intermuscular connective tissue of the muscles of the back to the skin of the back.”
- (g) Doubt is sometimes expressed as to the possibility of Hypoderma larvæ being able to wander from tissue to tissue, but dissection by workers on the Hypoderma problem at home and abroad have revealed the larvæ in a surprising number of places. In experiments where newly-hatched larvæ of Warble Flies and young larvæ taken from the gullet have been introduced under the skin of cattle and other animals, a later dissection of the animal has revealed considerable scattering and spread, from the place of introduction, in various directions. An experiment of Koorevaar's³ may be quoted as an example. He took eleven warble larvæ obtained in the spinal canal of a calf, and experimentally introduced them below the skin “in the left lumbar region of a small dog.” The wound quickly healed. Eighteen days later, with the same dog, Koorevaar placed other fifteen larvæ below the skin of the right side. In a fortnight the dog was killed, and on dissection the whole twenty-six larvæ were recovered. The wandering in the short time had been very considerable. Quoting from Imms: “Five of the larvæ were found still beneath

¹ “Warble Flies.” By S. Hadwen, in ‘Parasitology.’ Vol. 7. 1915.

² “Observations on the Migration of Warble Larvæ through the Tissues.” By S. Hadwen and E. A. Bruce. Bulletin No. 22. Department of Agriculture, Canada. 1916.

³ “*Hypoderma bovis* und ihre Jungsten Larven.” ‘Centralblatt für Bakter und Parasiten.’ Vol. 23. 1898.

the skin, and of these one was found in the left costal wall, one in front of the shoulder, one in the right thigh, one on the skull, and a fifth on the jaw. Six of the larvæ were found lying free in the peritoneal cavity between the folds of the intestine, and a further five were discovered in the fat of the spleen, kidneys, omentum, inguinal canal, and the retroperitoneal tissue respectively. On removing the kidneys three larvæ were found on the psoas muscles, and three more were met with in the wall of the œsophagus, two others in the peritracheal tissue, and two in the spinal canal between the dura mater and the peritoneum."

HARM AND LOSS DUE TO WARBLE FLIES.

It is difficult to give exact figures, but over the country generally there is a very great annual loss due to Warble Flies. The gadding of the cattle and their excitement must be unfavourable. Where milk cows are excited, and run, the milk suffers in quality and quantity. Excitement and over-exertion in in-calf cows may cause abortion.

There is some pain attending the entry under the skin of the newly-hatched larvæ, and discomfort at least must attend the presence in the gullet of a large number of maggots, and also the later migration of numerous larvæ to the back. The arrival and presence below the skin of the back of the third-last-stage larva is attended by sensitive swellings. The second-last, and the last, stage larva become somewhat shut off from more sensitive parts by the cyst, which gradually gets thicker. But the chamber may get full of pus resulting from the entry from outside of pus organisms; the result can be large abscesses, and the affected animal suffers pain and is unthrifty.

There is considerable money loss, extending to a penny or more per lb. per hide in the case of badly warbled hides. A loss of 5s. on a 60 lb. hide represents, in view of the large percentage of warbled hides that pass through the various markets, a large money wastage.

The butcher suffers in a further way. After the cattle have been slaughtered there is loss in dressing the carcass if the animal has been warbled. The warble larvæ in the sub-cutaneous tissue set up inflammation extending to the connective tissue, and the end result is a straw-coloured jelly-like stuff—it is commonly known as 'butcher's jelly'—which has to be scraped from the carcass after the hide has been removed. One of the late Miss Ormerod's correspondents wrote to her that in the worst part of the warble season he could

get bucketfuls of such inflamed tissue or 'jelly.' In the dressing of such a carcass there is waste and loss from parts that have to be cut away as unfit for food.

In spite of care in dressing the carcass, the beef—for example, a roast—may still bear traces of being from a warbled animal.

Lastly, there is the great annual loss from hides spoiled or ruined for tanning purposes and for leather (Fig. 33). In my collection are two such tanned hides—I owe one of them to the courtesy of Mr W. C. Callender—which, from the numerous holes in them, suggest the seats of a cane-

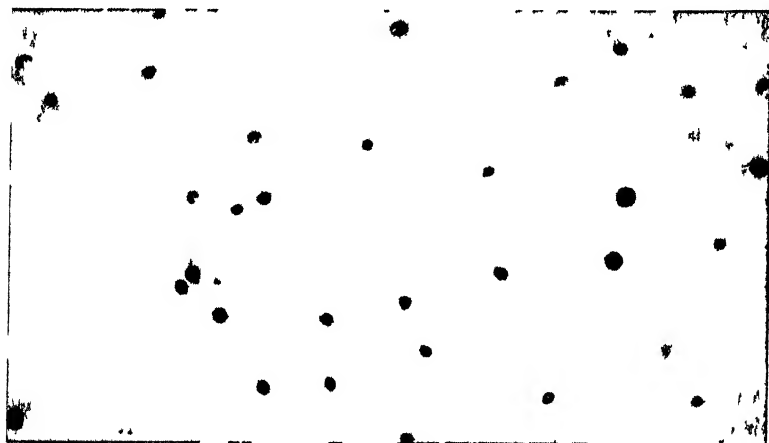


Fig 33—*Piece of hide of ox, after tanning, showing the warble holes*

bottomed chair, and while, of course, these are much worse than the averagely spoiled hide, the general loss to hide merchant and tanner is great.

ROSE FEVER.

From Denmark there has been recorded by Brodersen an ailment in cattle in pastures in spring or early summer. The disease, named by Brodersen¹ Rose Fever, has the following symptoms: puffy swellings on eyelids, muzzle, lower jaw, and often on udder and the neighbourhood of the anus. The disease passes off quickly, in some hours, and is not serious. While there are other explanations, Brodersen connects the ailment with the squeezing out of the larvæ of *Hypoderma*

¹ "Om Rosenfeber hos Kvoeg" By L Brodersen, in 'Maanedsskrift for Dyrlæger' Copenhagen

from the swellings. Brodersen suggests that when Warble Fly larvæ are broken *in situ*, the contents of the larva have a toxic effect on the host animal. Where no pressing out or breaking of larvæ has been practised, the symptoms of Rose Fever are ascribed to larvæ that have died in the host animal. In our experiments of different years we have failed to induce Rose Fever. We give here the story of three such experiments. In each case a skilled veterinary surgeon was present and recorded the cases.

Experiment 1.—A roan Shorthorn cow, an excellent milker, and in good condition. On 27th March, at 7.30 P.M., ten Hypoderma larvæ were broken as they lay in their cysts in the back of the cow. Save for a natural wince as pressure was applied to break the larvæ, no other symptom of discomfort was recorded. On 28th March, at 4.45 A.M., this cow ate as much and as heartily as usual, and showed no symptom of larvæ having been broken. Tested at 11.30 on 28th March, temperature, pulse, and respiration were normal. On 28th and 29th March the cow was in excellent health, and showed no sign of reaction to the breaking of the larvæ as they lay in their chambers or cysts. On 30th March, at 11.30 A.M., in the same cow, ten more larvæ were broken. Examined regularly from 30th March on to 9th April the cow continued to be perfectly normal, just as if nothing had been done to it.

Experiment 2.—A roan Shorthorn, twelve years old, milked twice daily, and a good milker. On 27th March ten warbles were broken where they lay in the back. This cow was in temperament a little more restless than the last, but no untoward symptom occurred. On 30th March, at 11.40 A.M., eleven more larvæ were broken. The animal continued to be quite normal. On 2nd April, at 11.35 A.M., eleven more larvæ were broken where they lay. On to 9th April, when the last examination for report was made, the cow was quite normal, just as if nothing had been done to it.

Experiment 3.—A Shorthorn cow, in good condition. On 20th April, at 2.50 P.M., the initial temperature was 101.98, the rate of pulse 79 per minute, and the respiration 22 per minute. By means of forceps with turned-up ends nineteen Hypoderma larvæ were broken where they lay, and the contents of the larva pressed out, a finger being applied to the hole in the swelling to prevent the contents from escaping; the region round each treated swelling was vigorously massaged. During the period when this was being done, the cow continued to feed on the hay before her, with an occasional twitch when extra force was applied to the warble swelling. At 3.15 P.M. the record was—pulse, 81 per minute; temperature, 101.95; respiration, 22 per minute. Records were taken again at 3.45 P.M. and 5.45 P.M., and on both

occasions the temperature was 102·0, the pulse 82 per minute, and the respiration 20 per minute. Such a simple process as milking often affects the cow more than the treatment given to the cow in this experiment.

ANAPHYLAXIS.

Muir and Ritchie's definition of Anaphylaxis is "the development under certain circumstances in an animal of a hypersensitiveness to foreign albuminous materials which in themselves are not essentially toxic." Hadwen and Bruce¹ injected extract from the warble larvæ into cattle, and these died. One of their experiments may be quoted. An extract from eight *lineatum* larvæ in 40 c.c. of salt solution was injected into the jugular vein of a heifer. "Before the dose was fully injected, the heifer's eyes and nose were changing colour. The breathing then became fast and laboured, the animal's tongue protruded, strings of saliva were seen, and tears came from the eyes. The animal next defecated and dribbled urine. Clear mucus came from the rectum. The anus was slightly swollen. The body turned a livid purplish colour. After a few convulsive struggles to gain its breath the animal fell; it made a few more efforts to breathe, and then died. All this occurred in less than five minutes."

I give below some notes on preliminary experiments which I had carried out at the Royal (Dick) Veterinary College. The injections were given by Mr A. Gofton, F.R.C.V.S., the Chief Veterinary Officer of the city of Edinburgh, and the warble extracts were prepared by Dr Ian Galloway, and the clinical record kept by Dr J. R. Greig. The subjects of experiment were three calves, two of which I owed to the kindness of Mr Ogilvie of Ballencrieff, and the third we bought in open market. The method adopted followed that of Hadwen and Bruce. The larvæ were taken from a warbled animal, and washed carefully in running water, placed on absorbent paper, and allowed to dry. The larvæ were then weighed. Next they were divided up and placed in a petri dish with some saline solution, and the mass transferred to a glass mortar and well macerated. The extract was then strained through a muslin cloth, and care taken to get as much of the extract from the counted and weighed warble larvæ as possible. The squeezed-out skins were weighed, and their weight subtracted from that of the weighed, complete, dried larvæ. Given a known weight of extract, salt solution was added to bring the injection material up to 40 c.c.

¹ "Anaphylaxis in Cattle and Sheep produced by the Larvæ of *H. bovis*, *H. lineatum*, and *Oestrus ovis*." By Seymour Hadwen and E. A. Bruce, 'Jour. Amer. Veter. Association.' Vol. 61. April 1917.

Case A.

A black heifer calf. Extract from four *Hypoderma* larvæ = 4.52 gms. .

18th May, at 5.27 P.M. 40 c.c. (saline solution and extract) injected intravenously.

5.28 P.M. The calf exhibited heaving respiration before the injection was completed.

5.30 P.M. Respiration 100. Markedly difficult and laboured breathing, and general distress. Salivation pronounced, and profuse flow of tears from both eyes. Urine and fæces passed in small amount, and apparently involuntarily. A husky cough.

5.31 P.M. Distress more marked; animal showed difficulty of maintaining standing position; movements staggering. Pulse at coccygeal artery imperceptible. Heart-beat very fast, and could not be counted. Visible mucosa slightly bluish-purple.

5.32 P.M. Distress still pronounced. Calf fell, but at once rose again.

5.36 P.M. Distress rather less evident. Respirations 60, laboured and gasping. Temperature 103° F. Still coughing at frequent intervals, and continuous flow of tears.

5.50 P.M. Distress still obvious. Respirations 56, laboured. Animal showed signs of weakness and exhaustion. Small quantities of yellow semi-fluid fæces passed.

5.52 P.M. Distress still obvious. Respirations 57, laboured. Animal lay down. Respirations now rapidly decreased in number, and animal much easier.

6 P.M. Respirations 20. Animal decidedly easier. Flow of tears still continued.

6.4 P.M. Tremors appeared in gluteal muscles (the muscles in the region of the rump or buttock).

6.15 P.M. Animal much easier, and appeared to be recovering.

6.30 P.M. The animal made some attempts to rise, but collapsed after each effort. Temperature 102° F.

From 6.30 to 7 P.M. The animal appeared brighter. There was a progressive decrease in the laboured breathing. Several unsuccessful attempts to rise.

7.10 P.M. Animal managed to rise and remained standing unsteadily; moved about a little; still difficulty in breathing; some salivation.

7.20 P.M. Moved unsteadily about the box. Masticated a piece of turnip. Attempted to drink water.

7.30 P.M. Temperature 101.8° F.

8.30 P.M. Temperature 100.2° F. No longer distressed. Ate a small quantity of a mixture of bran and oats.

9.30 P.M. Apparently quite recovered. Temperature 100.1° F.

10.30 P.M. Apparently quite recovered. Temperature 100·1° F.

11.30 P.M. Apparently normal. Temperature 100·1° F.

19th May, 12.45 A.M. Apparently normal. Ruminating. Temperature 100·1° F.

General Note.—The heifer calf made a perfect recovery, and showed no further abnormal symptoms. She did not lose condition, and continued to thrive.

Case B.

On 9th June the same heifer calf used in Case A had injected into the jugular vein 40 c.c. saline solution containing the 'extract' of four *Hypoderma* larvæ.

5.45 P.M. Injection given. Within one minute respirations 100, and somewhat laboured. A short husky cough. Flow of tears and some salivation present. The animal showed signs of considerable distress. Temperature normal. These symptoms declined, and at

6 P.M. the temperature remained normal, and the respirations were now 56. The symptoms continued to decline, and at

6.45 P.M. the animal appeared to have recovered, save for some salivation and lachrymation. Respirations normal. Temperature normal.

7.30 P.M. Animal apparently normal.

General Note.—Having watched the animal carefully through both injections (18th May and 9th June), my general impression was the small response to the second injection as compared with the symptoms exhibited after the first injection.

Case C.

A red heifer calf, bought in open market on 22nd May, received on 28th May an injection of the extract from four larvæ of *H. bovis* removed from an animal for the purpose of the experiment. The injection fluid consisted of 40 c.c. of saline solution containing 3·43 gms. of larval extract.

6.20 P.M. Injection given.

6.30 P.M. The animal commenced to show symptoms of discomfort, wandering uneasily round the box; sweating under the tail was observed; the anal ring became distinctly swollen.

6.45 P.M. Temperature 103° F. Pulse rate 102 per minute. Marked puffiness of the eyelids was observed. The calf, however, was showing no distress or any undue uneasiness.

7 P.M. Temperature 104·8° F. Pulse rate 101 per minute. The swelling of the eyelids was more pronounced. The calf was standing, and showed general tremors over all superficial muscles. Shivering all over.

- 7.30 P.M. The calf standing quietly. Swelling of the eyelids still present. No marked congestion of the conjunctival vessels. Twitching passing off. Temperature 104.2° F. Pulse rate 101 per minute.
- 8 P.M. Calf lying down; appears dozy, but not uneasy. Breathing not distressed. Swelling still present. No tremors or twitching. Temperature 104° F.
- 9 P.M. Temperature 103.8° F. Pulse 101 per minute. No desire for food, nor for linseed when added. Standing quietly.
- 9.30 P.M. Animal apparently normal. Temperature 103.8° F. Pulse 100. Fed with evident relish. In my notes I have, "When I saw this calf at 9.30 it was bullying away a bigger calf in the box from the trough and water."

Case D.

The same red heifer calf used in Case C received a second injection of warble larval extract on 9th June.

- 5.51 P.M. Injection given. Within a minute the respirations numbered 108 per minute; the calf was obviously uneasy. The temperature quickly rose to 104° F.
- 6 P.M. Uneasiness and increased respirations still manifest. Temperature 104° F. The uneasiness continued, and at
- 6.40 P.M. the respirations numbered 106, and were distressed. Temperature 105° F. Tremors over lips.
- 6.55 P.M. Respirations 106. Tremors over lips more pronounced, and also seen over shoulder muscles. The symptoms began to decline, and at
- 7.10 P.M. the tremors appeared to be passing off; the respirations, although still numbering about 100 per minute, were less distressed. Temperature 104.8° F.
- 7.25 P.M. Animal much easier and the respirations much slower and less distressed. Temperature 104.8° F. The animal continued to progress, and the further record was uneventful.

Case E.

May 28. Black stirk calf. A few minims of warble larval extract were introduced into the eye at

- 6.13 P.M., and slight irritation was shown immediately after the injection, and slight lachrymation.
- 6.40 P.M. Slight lachrymation and congestion of conjunctival vessels. Temperature 102° F. Breathing normal. The animal stood quietly and ruminated.
- 7.15 P.M. Temperature 102.4° . Animal moved about and picked at hay. No further congestion of conjunctival vessels. No swelling of eyelids or constitutional disturbance.

7.35 P.M. Congestion of conjunctival vessels subsiding; no further lachrymation. Temperature 102.4° F. The animal appeared quite at ease.

8.45 P.M. Temperature 102.4 . The animal appeared perfectly normal.

CONTROL OF THE OX-WARBLE FLIES.

One is often asked how it is that we cannot prevent the Ox-Warble Flies from laying their eggs. Quite a large number of dressings and some sprays have been tried. What was chiefly aimed at in experiments was to get some dressing with an odour so disagreeable to the flies as to repel or deter the females from laying. The difficulty occurs to everyone that odour soon goes with exposure to air and wind. The Departmental Committee,¹ among other things, tried birch-tar oil, but its use as a dressing to repel the flies could not be recommended, partly because the sticky nature of the dressing made the animals unsightly, and it took a long time to apply. Further, as the egg-laying period extends over many weeks, the needful repeated dressings with this or other deterrents make the measure impracticable. A repellent to give satisfaction must not only really repel, but must be easy to apply, must persist in its deterrent action for a fair length of time, must not hurt the animal, and must not be costly for labour in dressing.

Water and the shade of a barn act as aids in allowing the cattle to get away from the flies, and not only give them peace, but reduce the number of eggs laid on them.

In the United States cattle have been made to wade frequently through a vat containing an arsenical or other insecticide—*e.g.*, a 2 per cent coal-tar creosote solution or an arsenical solution.—the aim being to reduce or destroy the percentage of eggs laid low down on the legs. So far as experiment has gone this method has not proved satisfactory.

Control Measures against the Larvæ.—The Report of the Departmental Committee, already quoted, tells of an attempt to destroy the larvæ in their earliest stages while resident in the host. For this purpose arrhenal (a preparation of organic arsenic) was injected subcutaneously into five cattle. The experiment done at Athenry, Co. Galway, gave a negative result.

Squeezing out and destroying the final-stage larvæ as they lie in the warble is the soundest annihilative measure if it could be practised generally, and if it were practicable to have

¹ 'Report of the Departmental Committee on Warble Fly Pest.' Ministry of Agriculture and Fisheries. Published by His Majesty's Stationery Office. 1926. Price 1s. 9d.

it done thoroughly. Undoubtedly the practice would be onerous, especially in the early years, but if the treatment could be general, happy results would not be long in showing.

The next best treatment is the dressing or treatment of the final-stage larva with some substance which will kill it, and so prevent a new generation of flies and a new egg-laying. Such a dressing must not only successfully kill, but it must be cheap, give rise to no trouble in preparing it, must be easy and quick to apply, and must be harmless to cattle and their coat and to the workers. This is admittedly asking a good deal, but I am glad to say there is considerable reason for encouragement. Carpenter and his colleagues in Ireland had, after considerable tests and experiments, come to try tobacco powder and lime, and percentage results of final-stage larvæ killed by the dressing had been so satisfactory that the Departmental Committee undertook, after further successful results in Scotland in 1922, a mass experiment in 1923. Experiments were arranged for the county of East Lothian, and work was undertaken with the encouragement of the Board of Agriculture for Scotland, the help of the East of Scotland College of Agriculture and its County Organiser, and the friendly co-operation of the East Lothian farmers. Three post-graduate men—Dr Oldham, Mr T. Gibson. and Mr J. Cairns—were put in charge, each of one-third of the county. They administered the dressing, and some days later pressed out the treated larvæ and decided on their condition. This meant careful and very laborious work, more thorough than one could ever expect in ordinary farm practice. It was skilled work, because the men knew the subject well, and were familiar with the bionomics of the Warble Fly as far as known in 1923.

The first dressing tested was tobacco powder and lime—viz., 4 lb. tobacco powder, 1 lb. lime, 1 gallon water. To a gallon of water 1 lb. of fresh lime was added. Then the 4 lb. of tobacco powder was added, and the mixture allowed to stand for twenty-four hours. The liquid was then strained through coarse muslin or sacking and applied to the warbles on the back.

Space does not admit of details, but summarising the East Lothian experiment we got this result:—

Number of Warble Larvæ Dressed	Number Dead on Examination	Number Alive	Percentage Killed
3572	2916	656	82

The warbles received an individual dressing by syringe or cloth, or brush or sponge. The syringe used was a stout brass syringe with a comparatively blunt nozzle. The cloth or sponge was dipped in the dressing and then squeezed over the

hole in the swelling where the larva lay; at the same time a slight spiral movement of cloth or sponge removed any scab or plug that might have prevented entry of the dressing. The brush was a large paint brush. In comparative tests with syringe, cloth, sponge, the syringe proved the most certain, and there was little in it between cloth and sponge; what there was favoured the cloth. A disadvantage with regard to the tobacco powder and lime dressing is that the farmer, in making up the dressing, has to handle two different materials.

Partly because of this we arranged for a series of experiments with a preparation of Derris known as Kurmange. This was sent out in the form of a powder, and used in the strength of 1 ounce to a pint of water and 1 ounce to a quart of water.

I was fortunate in getting the services of Mr, now Dr, Ian Galloway, a qualified veterinary surgeon, to give this powder a thorough test. Again I have not room to give the details regarding farms in Berwickshire, Peebles, Mid-Lothian, but give only the main results.

Farms Visited.	Dressing.	Warbles Treated.	Larvæ Killed.	Percentage Killed.
15	1 oz. of Kurmange to 1 quart of water.	440	378	86
22	1 oz. of Kurmange to 1 pint of water.	614	581	95

Other dressings were tested by the Committee, and as a result the following received approval:—

Nicotine sulphate . . .	2 fluid ozs.
Calcium hydrate . . .	1 lb.
Water	1 gallon.

The quotation of this dressing gives me opportunity to say that no one of the dressings we experimented with was used as a wash over the whole back, but only the warbles were treated. I emphasise this, because in the treatment of skin parasites of different animals, the dressings used are some times toxic, safe enough to apply here and there, or perhaps over a fairly large patch of skin, but if applied as a general wash over the skin, some of them might prove fatal. Such a warning is necessary when material like nicotine is used, for applied all over the skin of the back and perhaps also rubbed in, the so treated animals can easily suffer. If one washed thoroughly the whole back of cattle with nicotine, in an hour or two they would show signs of distress. As I write, an example reaches me of bullocks whose backs were 'washed,' in an emergency, with one of the Sheep Dips. In an hour the

animals were frothing at the mouth. The effect on the warble larvæ was slight. The bullocks, however, received no real harm.

Sometimes ointments are used against the warble larvæ. An American prescription is 1 part iodoform to 5 parts vaselin. Dr Walton¹ tested this in North Wales and got satisfactory results. Two years ago, in 1927, I had a series of tests with this ointment, and the results, as measured by the mortality of the treated larvæ, were favourable.

Questions are often asked concerning, and objection taken to, methods of destruction of parasites which may leave the killed parasite in, or, in the case of the warble larvæ, under the skin. Hadwen, who writes with such knowledge and professional skill, gives support to the view that it is not a good system which leaves under the skin dead larvæ of the size of *Hypoderma* larvæ. Hadwen² is inclined to think that ointment should only be recommended against the larva when it has just perforated the skin, the larva being then small, and without the tough outer covering characteristic of the final-stage larva. "In abattoirs," he says, "it is common to find the skins of warble grubs under the hides, which have remained there unabsorbed." One can reply, however, that absorption may take place, and that dead skins can be thrown off by way of the hole leading to the cyst. Often after a dressing has killed the final-stage larva, the skin may be seen standing up out of the opening waiting to be thrown off. I was particularly interested in this when dealing with a number of milk cows under cover and accustomed to handling. I had broken, in experiment, a large number of warble larvæ as they lay in the back. I asked the cattleman in charge—an interested and knowledgeable man—not to groom the back of those animals as usual, but to wait until my observations were completed. The result was that for some days in succession a fair number of the skins of the squeezed and broken larvæ were seen projecting a little way out of the warble opening or standing up half-way out and more. We have also to remember that we must not forgo the chance to destroy the larva in its most vulnerable stage.

In 1927 we tested, for its effect on final-stage warble larvæ, the *Hypoderma* oil which is favoured in Denmark. While the *Hypoderma* oil did not do all the advertisements claimed for it, it can be recommended. Mr D. Stewart MacLagan, B.Sc., F.E.S., who reported on the experiments for me, gave his experience as follows: "The dressing has a strong odour resembling that of certain antiseptics, but cannot be called objectionable. Where less than four larvæ were dressed, the animal exhibited

¹ 'Welsh Journal of Agriculture' Vol. 1. 1925.

² "Insects affecting Live Stock." By S. Hadwen. Department of Agriculture, Dominion of Canada. Bulletin 29.

no signs of the effect of the oil. Where five or more larvæ required dressing the animal exhibited that it was at least feeling the presence of the oil. Sometimes the head was tossed up and down, and attempts were made to lick the dressing. Sometimes the animal stamped and occasionally lay down, but the irritation was only temporary, and passed off in five or seven minutes." Though satisfactory as a killing agent the price here is prohibitive.

An interesting and helpful report on experiments directed against the Ox-Warble Fly was issued in October 1929 from the Department of Agricultural Education, Shirehall, Worcester. The Report is by R. C. Gant, M.Sc., County Agricultural Organiser, and Dr C. L. Walton. Among interesting points is the success the experimenters obtained against the warble larvæ by using Polvo, a preparation of Derris. The Worshipful Company of Leathersellers have issued a memorandum on behalf of the newly organised Warble Fly Committee, recommending the following as a dressing against warble larvæ in the back :—

Derris powder	.	.	1 lb. (sold as Polvo).
Soft soap	.	.	$\frac{1}{4}$ lb.
Water	.	.	1 gallon.

How to Make.—Dissolve the soft soap in about a quart of boiling water and allow to cool,¹ pour it gradually over the Derris powder, which has been placed in a bucket, stirring well so as to wet every particle, then make up to 1 gallon with cold water. The mixture is now ready for use. The material should be used fresh.

Other countries are showing activity as regards Warble Flies—Denmark, Holland, Switzerland, Germany. In Denmark, by a law of 1923, the destruction of all larvæ is enforced. In 1924 1,781,059 animals were examined, and of these, 527,193 were found infested by warble larvæ and were treated. A certificate is required from the owner by the local Councils signed by a veterinary surgeon stating, by 1st April (cattle are generally taken out to the fields at the end of April), that his cattle are free from larvæ. Penalties are enforced in cases of default. The figures and statistics from 1923 on to the present attest how as a result the percentage of warbled hides has regularly fallen, and has reached a comparatively harmless figure.

Periodically in the last half-century there have been waves of interest in the Warble Fly question, followed by seasons when the general interest has seemed to wane. In the late 'eighties and early 'nineties of last century the late Miss

¹ To blood heat.

Ormerod did yeoman service in collecting and spreading wide, information regarding Warble Flies. The interest of the scientist has always continued, and numerous papers adding to our knowledge of difficult and obscure stages and phases in the Warble Flies and their biology have been published in the last fifty years. In a general account of the Warble Flies in 1919 I gave a list of thirty such papers. Bishopp and his colleagues, in a list of literature on Warble Flies, enumerate one hundred and twelve papers, of which nearly thirty have been published in the last ten or twelve years. References to the subject are scattered through the reports of the late Professor Theobald and Mr Warburton in England, in the Agriculture Department of Ireland Reports, in reports from Wales, and in our own Highland and Agricultural Society 'Transactions.' In 1887, at a General Meeting of the Highland and Agricultural Society, the late Secretary, Mr James Macdonald, "called attention to a circular which had been sent by the Society to nearly two hundred local Agricultural Associations in Scotland on the loss sustained by the farmers by the damage done to hides and even to beef by warbles, and asking them to get their members to adopt means to prevent the Warble Fly from depositing its eggs in the hides of animals." (It will be observed that the erroneous belief was then held that the female fly pierced the hide to lay her eggs.) Along with this circular were sent copies of two reports, and a leaflet on the Warble Fly, all by the late Miss Ormerod. Nothing very practical—especially in the way of getting combined effort—resulted. To-day the position is much more favourable. We are better equipped with knowledge. A Departmental Committee did a great deal of experimental work, and its encouraging report, issued in 1926, is available. The Ministry of Agriculture and the Department of Agriculture for Scotland are sympathetic and encouraging. A strong and representative Committee called together by the Worshipful Company of Leathersellers is engaged in a national campaign which seems likely to be fruitful. A great point about this Committee is the bringing together and representation of all interests—farmer, butcher, hide merchant, leather-seller. The Highland and Agricultural Society has given a generous grant in aid of experiment, the Leathersellers' Company and others through its influence and example have made grants, and the Empire Marketing Board has made a generous offer. We hope when the 1930 experiments in England and Scotland come to be collated and reported on, that the results will justify the effort and expenditure, and encourage sustained effort until the warble problem is solved. It is quite certain that, were the last-stage larvæ systematically destroyed in an area, the cattle in that area would cease to suffer from Warble Fly attack.

NOTES ON INTENSIVE CULTIVATION OF GRASSLAND.

By WILLIAM LOW of Balmakewan, Laurencekirk.

WITH the changed conditions of farming, and the decline in the area under arable cultivation, it becomes more and more urgent from the national outlook to make the cultivation of grass and the feeding of animals as thorough and efficient as possible.

Great Britain cannot feed the whole of its teeming millions with home-grown food, but if, while changing our methods, we can increase the supply of that commodity which is the more costly to import, there will be less ground for complaint that the farmer is neglecting his duty to the state for personal ends.

Two years ago we produced 53 per cent of the animal food required, but, if the whole or the greater part of the nation's meat supply were grown at home there would be gain instead of loss.

The country cannot drop arable cultivation entirely, for home-grown foods are required to feed the stock on our own farms. Fortunately the quality of the home-grown article is superior to anything that can be imported, either on the hoof or as chilled and frozen meat.

Two years ago (1928) the writer started an experiment to test the contention that with suitable manuring of the land and with close rotational grazing a much larger head of stock could be carried and finished on grassland. It had been done in other places, and was said to be profitable. The doubt in the writer's mind was whether the same quality would be got in the cattle when ready for the butcher.

The experiment was divided into two parts, a small area of 6 acres being devoted to feeding the home dairy cattle, while a larger block of 35 acres of grass was set aside for fattening butchers' bullocks.

DAIRY SECTION.

The 6 acres of grassland, 12 years down in grass, had been sown on sandy alluvial loam laid down by water over gravel. There was a thin layer of soil, and the field was never regarded

as worth regular cultivation. It had been used for occasional grazing. It had, however, been limed with carbonate of lime from Culter Paper Works, and the grass was fairly close. The field was divided into four equal paddocks, and this carried the dairy cows (7 to 8) all the season, and in addition followers for short periods to clean up. The farm work horses proved the most convenient followers, as they ate up the rough quickly, and allowed more time for growth. The field got an initial dressing during winter—2 tons carbonate of lime, 6 cwt. basic slag, and 4 cwt. kainit per acre—and was treated during the season with 2 cwt. of nitro chalk.

The initial dressing was given on 2nd April, and final dressing 17th September.

The cows were put out on 30th April for a short time daily, and this was increased until the weather allowed them to be out all night. They milked well, and a good percentage of butter-fat was obtained.

Similar treatment was continued in 1929, and though neither season was a good grazing one there was never any deficiency of keep. The pasture improved, and the rough natural grasses are disappearing.

	COST PER ACRE.					
	1928.			1929.		
	£	s.	d.	£	s.	d.
Rent and Rates	1	5	0	1	5	0
Fencing	0	16	3	Nil		
Water	Nil			Nil		
Lime and Basal	1	5	0	Nil		
Nitrogen	4	6	0	2	12	6
Feeding	6	6	11½	5	3	6
Labour	0	19	9½	0	6	5
TOTAL . . .	£14	19	0	£9	7	5

	Cost per Acre.	Returns.	Profit.
	£ s. d.	£ s. d.	£ s. d.
1928 . .	14 19 0	40 10 0	25 11 10
1929 . .	9 7 5	40 18 8	31 11 3

	1928.	1929.
Area	6 acres	6 acres
Paddocks	4	4
Grazing Period	April 30-Oct. 10	May 7-Oct. 14
Full Days	170	161
Cow Days per Acre	222.7	214.7
Acres per Cow	0.76	0.75
Gallons Milk per Acre	477.4	484.1

Too much was expended on concentrates compared with commercial dairy practice. When cows are on new grass none are given until the yield reaches 5 gallons per day. It is this saving in concentrated foods that will make the system of use to the farmer.

In spite of the heavy expenditure a profit can be shown of £8, 15s. 1d. per acre in 1928, and £11, 16s. 4½d. per acre in 1929.

BEEF SECTION.

The 35 acres devoted to this part of the experiment comprised two different pasture fields. Twenty-two acres was 4 year old grass with a good showing of wild white clover, while 13 acres was pasture over 50 years old. Part of the field at a higher level was very rough, and required a great deal of harrowing to get rid of the tufted old grass, while the lower part had been badly poached by cattle during the winter.

The whole 35 acres were divided into 7 plots—4 on the 4 year old grass varied somewhat in size from fully 5 acres to a little under 6 acres, the latter being very sandy soil and at times liable to flooding. The old pasture furnished 3 nearly equal plots, 2 of them on the upper part of the field and 1 on the lower. This latter plot was rolled with a light road roller, and never carried a great deal of grass all summer.

The soil was a light sandy loam. Plots Nos. 1, 2, 3, 4, and 7 were alluvial soil, rather better in quality than the dairy plots, while 5 and 6 had moorland pan at plough depth.

Season of 1928.

In 1928 all received a basal dressing of 6 cwt. basic slag. Nos. 1, 2, 3, and 4 got 2 tons carbonate of lime from Culter Paper Works, which, being in a fine powder, was similar to Billingham carbonate. Nos. 3, 4, 5, and 6 were each partly dressed with 4 cwt. kainit.

With regard to nitrogenous dressings, Nos. 1, 5, 6, and 7 got 3 applications, and Nos. 2, 3, and 4 got 2 applications, consisting of 1 cwt. neutral sulphate of ammonia on each occasion.

Water had to be provided for five out of the seven plots, and neither the cost of this nor the fencing was paid off in the first year.

The first dressing was given to No. 1 Plot on 29th February, and the others were treated at intervals of from 10 to 14 days.

Grazing commenced on 4th May, and was continued until 12th October.

The first lot of cattle was increased in number as the pasture improved until there were 35. The followers, ultimately numbering 30, were put out 5 days later, and the two lots followed each other in rotation over the whole 7 plots, by which time there was again keep for them on No. 1.

The leading lot were left on a plot until they had eaten the flush of the grass. The followers were not moved until their plot was eaten fairly bare. The time varied, but it was usually 4 to 5 days, and at times there was a gap of 1 or 2 days in moving up the followers.

After the followers had finished a plot it was harrowed with a heavy grass harrow, which had the effect of opening up the surface and spreading the droppings.

The leading cattle did well all through the summer, but the followers did not have the same chance until moved forward to take the place of cattle sent to the market.

Those killed in June dressed 58 per cent. Later in the season the percentage increased to 60 per cent, and some of the last cattle to be slaughtered dressed to 62 per cent.

The market prices were satisfactory until the end of July, when a slump came, and the result was disappointing.

Too much concentrated food was fed to the cattle, which were getting 8½ lb. per head per day, costing 10d. per day.

The grass improved throughout the season, and by the autumn no tufts were noticeable either when the leaders were started or after the followers had finished.

1928. <i>Expenditure per acre.</i>		<i>Returns.</i>	
Rents and rates	£1 5 0	Increases value and sales of	
Annual charge for fencing	0 6 2½	cattle	£8 6 0
„ „ water	0 6 8	Value of extra grazing	0 3 5
Manures—		Unexhausted manures	0 11 6
Lime	0 6 8½		
Basal manures	1 0 2		£9 0 11
Nitrogen	1 10 10	Balance	0 18 5
Labour	0 8 8		
Feeding	4 15 6		
	<u>£9 19 4</u>		<u>£9 19 4</u>

There were from 4th May to 12th October 253·5 cattle days per acre, or 0·64 acres per beast for 162 days.

The live-weight increase was 3·31 cwt. per acre.

Forty-five head were sold off the grass.

Season of 1929.

In preparation for the season 1929 parts of Plots 3, 4, 5, and 6, which had not been treated with kainit in 1928, received a dressing of that manure at the rate of 4 cwt. per acre. Plot 7, which was in an unsatisfactory condition the previous summer, received a dressing of lime and earth at the rate of 12 loads per acre, and in addition 4 cwt. kainit per acre. This made it the best plot in 1929, and it carried the stock for a rather longer period than any of the others.

Through illness the writer was unable to give personal attention to the experiment during the summer, and whether on that account, or because of drought and falling prices, the returns were less satisfactory than the previous year.

Grazing began too late, 16th May, and was continued until 9th October. There were 206·3 cattle days per acre, or 0·756 acres per head for 156 days.

The live-weight increase was 3·3 cwt. per acre.

Forty-eight head of cattle were sold off the grass.

This compared with 12 to 20 head, which was all that could be finished in the summer season of any year before the intensive method was begun.

While the results did not yield a commercial profit, they showed that a greater number of cattle could be fattened in Great Britain in times of emergency; and if it were worth while they could be brought to any degree of finish required by the trade.

At present the high prices prevailing for stores, and the poor return the farmer gets for fat cattle, makes it hardly worth the trouble and cost. Should, however, conditions alter, and the feared scarcity of world supply become a reality, it might pay the farmer to adopt this method of increasing the food supply of the nation.

COMMERCIAL PIG PRODUCTION IN SCOTLAND.

LESSONS FROM THE SCOTTISH BACON PIG COMPETITIONS.

By ALEX. CALDER, Ph.D., B.Sc., Animal Breeding Research Department,
University of Edinburgh.

Why are there so many Inferior Bacon Pigs in Scotland?

The day of antagonism between the bacon and pork markets in this country is passing quickly. Until a comparatively recent date the pork markets favoured a relatively short thick-set type of pig, which, if carried on to bacon weight, usually produced a second-rate quality of bacon. This is, without doubt, one of the principal reasons why such a large proportion of bacon pigs in this country are of inferior quality; the periodical surplus of pigs intended for pork purposes are carried on to bacon weights and marketed in direct competition with imported bacon. On the other hand, countries which send us bacon in large quantities breed primarily for bacon production. Their pigs are being rapidly improved in bacon type through their adoption of standards of excellence which conform as closely as possible with commercial requirements, and thus their bacon is suitably graded for the special requirements of the British bacon markets. In this country we have no standard of excellence based on utility for commercial purposes, and we have no scheme whereby it is possible for us to grade our home-produced bacon; these points, together with the conflict of types that have hitherto been in demand on the pork and bacon markets, largely account for the fact that foreign competition has pressed home producers into the background in our own bacon markets.

What are the Prospects for Uniformity of Type?

What hopes are there for improvement? In view of the fact that pork production is the basis of the home pig industry and that bacon production is to a considerable extent the surplus of the pork markets, too many people are inclined to neglect possibilities by which bacon production at home may

be improved. Such an attitude is anything but progressive, and must be suppressed as far as possible, because expansion of pig breeding in this country can only come through increased bacon production, there being as a rule ample supplies of home pigs to satisfy the requirements of our pork markets. An increase in bacon production can only be brought about if steps are taken to improve the quality of our bacon pigs, so enabling us to compete more favourably with the foreign article.

The hope of the moment for improvement in the type of our bacon pigs lies in the change in fashion regarding the pork requirements of the housewife in this country. Leaner pork is being demanded, for public taste is changing. The increased use of gas for cooking, the smallness of modern households, and, associated therewith, the increased popularity of dining out, has focussed present day pork demands very largely on small lean joints with a corresponding decrease in the demand for roasts and big joints carrying a fair proportion of fat. This change in fashion in pork consumption has brought with it the necessity for changing the type of our pork pigs towards more length, neater head and shoulders, finer bone, and a smaller proportion of fat. In fact the new pork type is much the same as that most favoured in bacon pigs. There is no doubt that dual purpose of type is going to help the pig industry in this country considerably, and especially the suitability for bacon purposes of the surplus of pigs intended for the pork market which are carried on to bacon weight.

Dual purpose type is being helped from another angle—namely, the trend of demand in bacon requirements. With the exception of certain industrial areas where there is still a heavy demand for fatty bacon, the swing of the market indicates an increasing nicety of taste. Provision merchants and other retailers of bacon state that there is an increasing tendency amongst most housewives to dislike big slices of bacon carrying a heavy rind of fat. Moreover, the bacon cutting machine which is now in general use all over the country makes the neatest and most evenly cut slices from sides of 50 lb. and under, and of rolls of about half that weight. This all points to the increasing favour for bacon from pigs around 200 lb. live weight.

How dual-purpose Type should affect Pig Production in Scotland.

As compared with the rest of the country, Scotland should benefit most of all by the present trend towards sameness of type in both pork and bacon pigs. Why should this be so? In the first place, pig production in Scotland is not burdened with a large number of different classes of pig markets. There are two main outlets: (a) for porkers ranging in live weight

between 140 lb. and 170 lb., and (b) for baconers ranging between 180 lb. and 220 lb. live weight. There is no outlet for small porkers in Scotland, neither does it pay Scottish breeders to produce heavy pigs best suited for the Midland trade. When prices are at boom level, however, shortage of supplies may bring for these heavy pigs as much per lb. as for lighter pigs; but when supplies are plentiful, the distance of Scotland from markets requiring steady supplies of heavy pigs, and more particularly the lack of any marketing organisation, is strongly reflected in the low price per lb. received for pigs much in excess of 220 lb. live weight. Consequently with the relatively small difference between the weights of pigs required for pork and bacon purposes respectively, Scottish breeders have a particularly favourable opportunity to breed a uniform type of pig for both their pork and bacon markets.

The attainment of dual purpose type is also favoured by the pure breeds and crosses used for commercial purposes in Scotland. Large Whites predominate among the pure-bred pigs used for commercial purposes. Of the crosses, the Large White \times Large Black cross is the most popular. The Large White \times Middle White cross is also largely used. In the Edinburgh district and in the Lothians the Berkshire \times Large White cross, and also to some extent pigs off cross-bred Berkshire \times Large White sows mated to the Large White boar, are meeting with increased favour. Pigs of such breeding are of good pork type, and also are well suited for the production of light and medium baconers.

Possibilities for Expansion.

Scotland satisfies the requirements of her own pork markets, consequently there is no room for expansion in this direction within her own borders. Moreover, our pork pigs conform more closely to commercial requirements than do our bacon pigs. This can be explained by the fact that a large proportion of our pork pigs are marketed through dead meat markets or sold direct to butchers. Returns by marketing through either of these two channels provide producers with the weights of the carcasses and the exact price received per lb. dead weight. With this information producers know the type and weight of pig which brings them the best returns.

On the other hand, bacon production in Scotland, as throughout the rest of the country, is seriously out of harmony with the requirements of the commercial markets. There is a general tendency to keep bacon pigs on the farm until they are much too heavy to suit the special requirements of the Wiltshire or Ayrshire trade. The high proportion of overweight pigs has two serious effects. Firstly, the producer receives a smaller price per lb. live weight, except when

supplies are very short; and secondly, the foreigner gets a better chance to compete more successfully in our home bacon markets. Type also leaves much to be desired. In this age of commercialisation, it is surprising that excellence in the bacon pig is still to a great extent estimated on an æsthetic rather than on a commercial basis.

Unfortunately that type of pig which is most pleasing to the eye is very often far from perfection from a commercial point of view. No doubt this accounts for the fact that a large proportion of our bacon pigs are of a type which carries too much fat, and which are specially characterised by breadth and flatness of back, shortness of side, tendency towards curliness of the hair, and too large a proportion of flesh carried on the low-priced parts such as head, neck, and shoulders. Are we to blame producers for the inferiority of a large proportion of our bacon pigs? The answer must be in the negative, for, owing to faulty conditions of marketing, the producers get little encouragement to pay more attention to the quality of their bacon pigs. In Scotland the majority of bacon pigs are sold through the auction marts; thus producers have no exact knowledge of the weights of their pigs and the price per lb. received. In fact opinion is rife that because big pigs fetch more per head, that is the class to produce. If it were made compulsory that pigs sold at marts should be passed over the weigh-bridge, producers would have a better chance of seeing that pigs of suitable weights bring them the highest price per lb. On the other hand, when consignments are sent direct from the farm to the factory—this is most common in the South-West of Scotland—a flat rate of prices is usually paid for pigs of all types and weights: that is no encouragement to the producer to give special attention to the production of prime quality pigs. Is it to be wondered at that we are having a hard fight to compete against imported bacon?

Expansion of pig breeding, however, can only come through increased production of bacon; there is no room for increased pork production. Such expansion can only be achieved, firstly, through improving the average quality of our bacon pigs, and secondly, through striving to put good pigs to buyers who are prepared to pay more for superior quality. How, then, can producers both see for themselves and get reliable information concerning the type and weight of pigs most suitable for bacon purposes? Bacon Pig Competitions are of considerable value in this direction, and I would therefore like to outline the value of information derived from the Scottish Bacon Pig Competitions.

The Scottish Bacon Pig Competitions—Objects and Plan.

During the past six years there have been five Bacon Pig

Competitions in Scotland. These Competitions were organised by the Scottish National Association of Pig Breeders, and were strongly supported, financially and otherwise, by the Highland and Agricultural Society and Scottish Bacon Curers. In future they are to be run under the direct auspices of the Highland and Agricultural Society.

The Competition is primarily designed to provide as much information as possible on bacon type—principally those points which in the live pig give the truest indication of suitability for bacon purposes. In order to obtain such information the pigs are judged (a) as on hoof, (b) as carcasses, and (c) as cured Ayrshire bacon, the judging throughout the Competition being carried out by the same man. The judging is arranged in three stages, for the good reason that we are as yet very undecided as to what constitutes the ideal bacon type, and by judging the pigs as carcasses and as cured bacon it is possible to ascertain whether the live pigs have been judged in accordance with the requirements of the bacon market. In the earlier Competitions consistent placings in the three stages were not obtained. In fact, on two occasions, the placings of the live pigs were almost completely reversed in the carcass and cured bacon stages. This, however, was not so much due to faulty judging as to weakness in the plan of the Competition, which had been subsequently altered as far as possible. In the last two Competitions satisfactory conformity in the placings was obtained, so it can now be claimed that we have at least attained a system of judging which will give the judge a good chance of placing the live pigs according to their actual suitability for bacon purposes.

The Value of the Competitions. Seeing the Live Pigs. Encouraging Marketing at Suitable Weights.

The live pigs are exhibited and judged at the Highland Show each year, and this affords the best opportunity for a large number of people to see the type and weight of pig most favoured for bacon purposes. Simply seeing the exhibits and observing the order of merit in which they are placed is undoubtedly one of the most valuable aspects of the Competition, for most farmers are much more expert in spotting a bad bullock or bad sheep than they are in spotting a bad pig. A large number of breeders and feeders take a very keen interest in the placings, and those who are under the impression that a bacon pig should be big do not spare criticism to the effect that the judgment is all wrong and that the prize pens are too much like porkers to be worthy of heading the prize list in a Bacon Pig Competition. It is by way of arousing such interest and criticism that advice can

be effectively put over concerning the weight of pig most suitable for commercial requirements.

In the Conditions of Competition it is stated that exhibits should be between 180 lb. and 220 lb. live weight. Heavier pigs are not debarred from competing, for it is of considerable educational value to have over-weight exhibits in order that producers may be the better able to appreciate the unsuitability of heavy pigs for present day bacon requirements. Heavy pigs are penalised by marks being proportionately deducted according to the weight in excess of 220 lb.

The discouragement of heavy weight must have been taken to heart at least among those who exhibit at the Competitions, for there has been a distinct improvement in this respect from year to year. In the earlier Competitions a large proportion of the exhibits were much too heavy to produce the best class of bacon—not to speak of unsuitability of type. There were sixteen entries forward at the third Competition, and of these only five exhibits were of suitable weights; the heaviest exhibit that year averaged 295 lb. live weight at the age of nine months. At the fourth Competition only four out of twelve exhibits were over weight. It is to be hoped that the suitability of last year's exhibits from the point of view of weight will be maintained, for each of the thirteen exhibits forward conformed to the requirements that no pig should exceed 220 lb. live weight.

Getting the Ideal Type.

Actually to see the type of pig to which preference is given should be of great value, as there is still a good deal of misconception concerning the general form and proportions of the bacon pig best suited to the requirements of the curer. Many producers believe in a big frame and plenty of bone as an indication of stamina, but too big a frame brings with it late maturity and the necessity of keeping the pig to a heavy weight before a proper finish can be obtained. Heavy bone, although sometimes an advantage in winter feeding, is usually associated with coarseness of quality and a low killing percentage, which means waste. The type of to-day calls for a neat and compact fore-end, for that is the cheapest part of the pig; plenty of length of side without being loosely coupled, good loin, flank, and hams, so as to give a high proportion of dear cuts; absence of flat back and breadth at the withers, for that indicates a large amount of fat; and fineness of bone, both from the point of view of economy and as an indication of quality. Yet how many of our bacon pigs are still of the heavy shouldered, flat-backed, curly haired class—an alarmingly high proportion. At last year's Competition most of the exhibits were of excellent type, and showed a distinct improvement in this direction on previous Competitions.

Observing the Breeding of Quality Exhibits.

The Competition is limited to pure-bred and first-cross pigs. It is rather interesting to note that certain crosses which figured prominently in the list of entries at the earlier Competitions have not been represented in the more recent Competitions. Without making further comment, this should indicate the value of the Competitions in showing up the relative merits of the various breeds and crosses for bacon production. Perhaps it would not be out of place to mention the breeding of the first three pens at last year's Competition. The first prize pen of pigs which maintained their place throughout the three stages were Tamworth \times Large White crosses—an interesting and unusual cross for Scottish producers to witness. These pigs were of excellent quality and fine in the bone. It would be interesting to have further entries of this breeding at future Competitions. The second and third prize pens—both Large Whites—made a remarkable performance as regards early maturity. These two lots were carrying a magnificent finish at slightly under 180 lb. live weight at the age of five months. The chief fault of the Large White as a pure breed from the point of view of commercial requirements is inability to take on a proper finish at the most suitable weight for bacon purposes. The quality of the two pens of Large Whites referred to, however, demonstrates that with selection along proper lines—mainly for earlier maturity and fine bone—strains of Large Whites could be built up which would be in every respect ideally suited to the modern requirements of the commercial markets. These two pens of Large Whites conformed exceedingly well to the dual type suitable for either pork or bacon purposes, described in the first part of this article.

What the Carcasses Show.

Scottish bacon curers have co-operated wholeheartedly in the effort to make these Competitions a success. At each Competition a curer has judged the three stages single-handed, and after the Highland Show the pigs are put through to the finished article—viz., the cured bacon—at the factory owned or managed by the judge as the case may be. The judging of the carcasses takes place on the Tuesday following the Highland Show. To those who have followed carefully the placings of the pigs on hoof and who have carried with them an imaginary picture of the live exhibits, it is most interesting and instructive to see the dressed carcasses after they have been halved; and, moreover, to observe the reasons for any difference there may be in the order of placings between the first and second stages. At the carcass stage one has a splendid chance of seeing why heavy pigs are unsuited to the requirements of the trade in both Wiltshire and Ayrshire

bacon. The most serious objection to heavy pigs is that they usually carry too much fat, and particularly too thick a layer of back fat. At the third Competition, when only five of the sixteen entries were of suitable weights, there was only one pair of pigs from which it was not necessary to remove back fat. Curers desire that the back fat should not exceed $1\frac{1}{4}$ to $1\frac{1}{2}$ inches in thickness. With the suitable weights and better type of exhibits at last year's Competition, it was only found necessary to remove back fat from the shoulder area of two pigs. From an examination of the carcasses, producers have a good chance of seeing why the ideal top of the shoulder of a bacon pig should be nicely tapered, and not like that which is desired in the prime bullock. With a broad flat shoulder there is usually too much fat and too much weight in front of the girth.

Showing up the Effects of Bad Feeding.

Exhibitors are asked to produce a statement of feeding for at least a month previous to the Competition, as the quality of the bacon is influenced to a large extent by the nature of the rations used and especially the rations on which the pigs are finished. Inferior quality bacon and taint can usually be attributed to certain feeding stuffs having been used in unsuitable proportions. While foods such as certain of the maize and rice meals, fish meal, &c., are very useful when used in suitable proportions, the soft texture and oily flavour which results from using excessive quantities of these foods—especially at the finishing stages—is well shown up by examining the carcasses and by sampling the cooked bacon. As an example of what these Competitions can do to point out faults in feeding, I wish specially to refer to one pen of pigs at last year's Competition. The pigs in question were of suitable weights, of excellent type, and well finished, but they had an oily appearance of the skin, for which reason the judge did not place them. At the carcass stage the sides, although well proportioned, were of very inferior quality, the fat being very soft and oily. On looking up the feeding, it was found that the finishing ration contained 20 per cent maize, together with 10 per cent fish meal. That explained why such well-shaped pigs were of inferior quality.

What the Rolls Show.

After being put through a mild Ayrshire cure the bacon is judged as rolls. At this stage the quality of the finished article can be tested. A sample of bacon from a middle out of each pig is cooked and tested. This gives the decisive test for quality. Feeding tells in the cooking tests. At last year's Competition the pens which had attained bacon weight at an early age gave the sweetest and most delicate bacon. This

finding was supported by several curers, who expressed the opinion that quick maturity promotes good flavour. Yet how many producers still believe that the greater firmness which is usually obtained with a slower rate of gain brings with it better quality from every point of view? Seeing the rolls of bacon, and at the same time carrying an impression of the pigs from which they were produced, conveys the best idea (a) of the size of pig that produces the most convenient sized slices of bacon, and (b) the class of pig that suits the retail trade best. With the rolls before one it is easy to appreciate why the retailer wants a light fore-end and a long side; it is a higher proportion of dear cuts that the retailer is after.

Judging the pigs at three different stages is the best way to get the most information about bacon type and general suitability for bacon purposes.

Economy of Production.

Commercial pig production is more likely to pay (a) by getting the best market returns, which necessitates quality in the article produced, and (b) by producing that article at the lowest possible cost. Feeding, the principal item of expenditure in production, covers up to 90 per cent of the total cost. To keep down costs of feeding there are two considerations of great importance. Firstly, the use of a suitable ration composed as cheaply as possible; and secondly, getting the pigs to put on weight at a low food consumption per unit of live weight gain.

We all know that in the pig, quality and capacity to put on flesh economically do not necessarily go together. From the farmer's point of view economical feeding and quick growth is of the greatest importance; quality in a pig that has taken nine months to reach market weight is of little value to the producer. The Competition is planned to encourage quick maturity as far as it is possible to do so with the information available. It is not possible to get exhibitors to keep a record of the amount of food consumed by their exhibits, which means that no accurate estimate of economy of feeding can be obtained. We know, however, the age and live weights of the exhibits from which the average weekly live weight gain can be obtained. We also have a record of the rations used. Provided commercial rations have been used, it usually follows that quick maturity—a high weight for age—means economical production. Quick maturity, therefore, is encouraged by giving a liberal allowance of points for weight for age. Stressing the value of quick maturity has not been without some effect, for at last year's Competition two pens of pigs had reached about 180 lb. live weight in five months. We know how these pigs were fed—75 per cent of their ration consisted of home-grown grains. With such feeding and an

average weekly live weight gain of 9·7 lb. it could not be denied that these pigs must have been very economical feeders. It is not claimed that weight for age should be regarded as anything approaching a true indication of economy of live weight gain; this is, however, the best gauge of economy that can be used in the Competition, and as such we can do no better than use it.

Stressing weight for age is making progress exhibitors pay more attention to keeping records of the progress of pigs intended for entering the Competition. Fortnightly weighings had been made in the case of five different entries at last year's Competition, and, moreover, for three of these entries a complete record was kept of the amount of food consumed by the pigs. The champion pen of pigs at the last Competition had on average consumed 3·6 lb. of meal per lb. of live weight gain, which demonstrates that this entry combined superiority of quality with economy of production. Some readers may think that keeping a record of the amount of food fed must mean a lot of extra work; this opinion would have been justifiable at one time, but new methods have now been brought into operation, whereby little or no extra labour is incurred in keeping a complete record of the food consumed by each pen.

The Future of the Competitions.

The Competitions may or may not have been of appreciable benefit to pig breeders in Scotland, generally speaking, but there is little doubt that among the group of producers who exhibit many valuable lessons have been learned. The success or otherwise of each Competition depends largely on getting a representative number of entries forward. The writer is of the opinion that owing to the heavy expense of exhibiting, attractive money prizes must be offered in order to encourage producers to show their pigs. The prize money is to be almost doubled for the 1930 Competition, and it is to be hoped the stimulus of good prizes will encourage competition.

Conclusions.

There is no doubt that the change now taking place in the type of pig demanded in the pork markets must necessarily modify breeding practice towards the attainment of a type suitable for both pork and bacon purposes. The Bacon Pig Competition, by encouraging (a) marketing at light weights, (b) early maturity, and (c) fineness of bone, can be of great assistance in the attainment of the dual purpose type.

POTATOES IN STOCK FEEDING.

By J. K. THOMPSON, N.D.A., Kirton, Lincolnshire.

THE Potato, probably the most common of all human foods in northern Europe, is comparatively little used in the feeding of live-stock. In this country little is known about the potato as a stock food. One can actually meet farmers who hold the view that the tuber has absolutely no stock-feeding value whatsoever, and that it is better to dump chats and surplus tubers and allow them to rot than turn them to account as a feeding-stuff for farm animals. The writer came across this idea for the first time following a lecture given by him on the value of potatoes in pig feeding. In the course of discussion a farmer stated that he was amazed at the results obtained in an experiment conducted by the writer, and to which he had referred in the course of the lecture. The farmer further stated that he had long understood that potatoes had no value at all in stock feeding. In subsequent lectures the same point arose several times, and the writer found the idea more widespread than he would have imagined, and this in a great potato-growing area. However, though prevalent, this view does not represent that of the great majority of the potato growers in the Parts of Holland, Lincolnshire, nor is it the general practice to dump surplus or chat potatoes rather than use them in the feeding of stock. It must, however, be admitted that some considerable quantities of tubers are thus treated, not because the growers do not believe in potatoes as a stock food, but because these growers are not stock keepers, and have no appreciation of the valuable side-line to the main activity of potato growing that they are neglecting.

Generally speaking, the Holland farmers are not extensive stock keepers, but yet many of them do fatten considerable numbers of bullocks in the winter, and potatoes usually form the basis of the rations. Then practically all of these farmers are pig keepers, many of them avowedly keeping pigs for the sole purpose of turning to account otherwise unsaleable tubers.

It is likely enough that the potato has never taken a prominent place as a stock food because it occupies such a valuable place as a human food, and as such usually commands

a figure on the market that prohibits consideration of it as a stock food. Its very value and safeness, however, as a human food should carry confidence when it must be considered as a stock food; and, indeed, properly used the potato is a very valuable source of succulent and carbohydrate matter in animal feeding.

At a time when surplus stocks of tubers are held on the farms, or at a time of very low prices, alternative uses for the crop become a matter of urgent importance, if the grower is to make the best of a year's work and expenditure, or even if he is to save himself from disaster. One such alternative, and it is really the only one to which the grower in this country can turn at the moment, is the feeding of his crop, or a part of it, to his stock. It is not suggested that this alternative represents a proposition that will be as profitable as a good price obtained through the ordinary channels. It represents, however, a means of placing something against the costs of production, and preventing part of the loss which must otherwise accrue when slump conditions prevail on the usual market. Further, in a case of over-production due to heavy crops, or large acreage, or both, the use of a proportion of the crop—and that the smaller and inferior stuff—in stock feeding would relieve the ordinary market, and tend to steady prices at a more satisfactory level.

For some time now the writer has been engaged in advising farmers in the Holland area of Lincolnshire on the feeding of stock, and, in addition, he has had the opportunity of conducting some practical feeding tests with pigs on the experimental farm attached to the Agricultural Institute at Kirton, near Boston. As a result, he has had the opportunity of making a fairly extensive acquaintance with the potato as a foodstuff for live-stock. In practically all the cases in which he is asked for advice potatoes form one of the available foods, and they are expected to form a substantial part of the ration ultimately advised. It is as a result of this experience that the writer has undertaken this article, feeling that nothing but good can come of recording what practice he has become acquainted with, and what experience he has gained. It is intended in this article to incorporate a good deal of the scientific knowledge of the potato as a feeding-stuff, which is available from Kellner, Linton, and others, and to fill up with details of the practical use and experience available as a result of the extensive use of the tuber as a feeding-stuff in this area. Thus it is hoped to make the article fairly comprehensive.

In the first place, a few notes relative to the composition of the potato are necessary. The tuber supplies what is essentially a carbohydrate food, of succulent nature if used in the raw state. Water is its main constituent, and starch

is its principal dry-matter constituent. Kellner gives its composition as follows :—

CRUDE NUTRIENTS.

State of Tuber.	Water %	Crude Protein. %	Crude Fat. %	Nitrogen Free Extract Substances (Carbohydrates). %	Crude Fibre. %	Ash. %
Medium	75.0	2.1	0.1	21.0	0.7	1.1
Watery	83.0	1.6	0.1	13.9	0.6	0.8
Dry	74.0	2.1	0.1	21.9	0.8	1.1
Very Dry	68.0	2.5	0.2	27.3	0.9	1.1

DIGESTIBLE NUTRIENTS.

State of Tuber	Crude Protein. %	Crude Fat. %	Nitrogen Free Extract Substances (Carbohydrates). %	Crude Fibre. %
Medium	1.1	...	18.9	...
Watery	0.9	...	12.5	...
Dry	1.1	...	19.7	...
Very Dry	1.3	...	24.6	...

State of Tuber.	Value. (Full Value = 100).	Digestible True Protein.	Starch Equivalent per 100 lb.
Medium	100	0.1	19.0
Watery	100	0.2	12.7
Dry	100	0.1	19.8
Very Dry	100	0.2	24.8

In his excellent work 'Animal Nutrition and Veterinary Dietetics,' Linton gives the following figures :—

DIGESTIBLE FOOD CONSTITUENTS—PER CENT.

Water.	Crude Protein	Protein Equivalent.	Pure Protein.	Fat.
75	1	0.5	0.1	...

Carbohydrates.		Food Value.	Starch Equivalent.	Nutritive Ratio.
Soluble.	Fibre.			
18	...	100	18	36

Each set of figures clearly shows the essentially carbohydrate character of the tuber; the digestible protein content is almost insignificant, and even that is largely amide in character, with the result that the protein equivalent is extremely low. Potato proteins, however, are very well utilised, as Funk records in his work 'The Vitamines.' The fibre content of the tuber is low, and apparently what little there is is indigestible, while the same remark applies to fat. The food value figure is significant, showing as it does that the digested material of the potato is 100 per cent efficient. Not many foods show such a standard of efficiency, and all others that are equally efficient, with the exception of milk, which stands in a special light, belong to the class of foods commonly termed concentrates, the potato being the only bulky food to return this high value. By comparison swedes show a value of 85, mangolds 72, and turnips 77.

The figures given by Kellner demonstrate the differences between different classes of tubers. These differences, in their extremes, are very wide indeed, showing a variation of 12 per cent in the starch values of watery and very dry tubers, while the average starch value is about 18. This latter figure may generally be used in compiling rations, but obviously, under exceptional circumstances, the more nearly correct figures should be used. Kellner observes that the composition of potatoes depends upon various conditions, such as variety, soil, weather, size of tubers, manuring, &c. After wet weather, liberal nitrogenous manuring, early harvest, &c., the tubers are watery and poor in starch. Large quantities of kainit produce the same effect, whilst potash salts reduce the dry matter very little or not at all. Linton remarks that potatoes which become waxy in keeping are those which contain relatively more juice and protein. Thus young tubers, which have not laid down their maximum of starch, are, as a rule, more waxy than mature tubers.

The ash content of the tubers is low. According to the figures given in Bulletin No. 156*b*, issued by the Department of Agriculture of the University of Leeds, the total ash amounts to 1 per cent, and is made up as follows:—

Lime.	Magnesia.	Potash.	Soda.	Iron Oxide.	Phosphoric Oxide.	Chlorine.	Sulphur Oxide.
·03	·03	·60	—	·01	·15	·03	·09

This shows potash to be the most abundant ash constituent, whilst phosphoric oxide is low, and lime lower still. Generally speaking, these two latter constituents are those for which there is the greatest demand by the animal, and those which are most likely to be in short supply.

Funk records in 'The Vitamines' that potatoes (cooked and raw) have been found to contain all three vitamines

(A., B., and C.) in small quantities. Of these vitamine A. is only present in very small amount. Apparently vitamine B. is the most abundant, the potato being a useful source of this.

Kellner gives further valuable figures relative to the digestibility of potatoes in the case of each of the different farm animals. This is a very important aspect of the nutritional value of feeding-stuffs, and has, as yet, received but insufficient attention by workers in this subject. It is of much importance, since the capacity of the different classes of farm stock to deal with any particular food is often very different, and the average figures as given in tables such as those of Kellner, Linton, or those in the Leeds University bulletin already referred to, may or may not be near the truth for any particular case. As things are there is considerable room for error.

Here are Kellner's figures :—

Investigated with	Number of Separate Investigations.	Organic Matter.	Crude Protein.	Carbohydrates.	Fibre.
Ruminants	30	83	51	90	...
Horses	1	93	88	99	9
Pigs	13	94	71	98	55

These figures would show that of the farm animals the pig is capable of making the best use of potatoes, but Kellner does not indicate whether the tubers were cooked or not for the pigs. But since Kellner emphasises the necessity of cooking the tubers in this case, it is to be assumed that they were fed in that state, whereas they would almost certainly be fed raw in the tests with cattle and horses. Had the tubers been fed raw to pigs it is likely that the resulting figures would not have been so good. The horse returns remarkably good figures, but these figures are given as a result of one investigation only, and therefore too much importance cannot be attached to them. The ruminant animals make what may appear a surprisingly low use of potatoes, and it would appear possible that this is due to fermentation in the paunch, leading to a wastage of some of the nutrient matter. It is to be noted that Kellner's figures show that the ruminant makes better use of any one of the ordinary root crops than of potatoes, digesting—

87 per cent of the organic matter of mangolds.

87 per cent of the organic matter of turnips.

97 per cent of the organic matter of swedes.

A regular constituent of all parts of the potato plant is the alkaloid 'solanine,' the tubers, according to Kellner,

containing about $\cdot 1$ gram in 1 kilogramme = $\cdot 01$ per cent. Solanine is, of course, a poisonous principle, and may be the cause of serious trouble where potatoes are used in feeding, unless proper precautions are taken. This alkaloid does not increase when potatoes are stored or when they decompose, but it passes in considerable quantities into the young shoots when the tubers chit or sprout, so that the sprouts (Kellner) may contain as much as 50 grams per kilogramme = 5 per cent. Thus the sprouts are a possible source of danger to stock, and care should be taken that they are not fed. In the Holland area I find that, in some cases, care is taken to remove the bulk of the sprouts from sprouted tubers when these are being fed, the farmer realising the possibility of trouble, but in other cases no attention is paid to the matter, and the tubers are fed with the 'chits' on. It is usually in the later spring and early summer, where stocks of potatoes are still on hand, that chitted tubers are to be found, and very often at this time—especially when the chitting is at its worst—the tubers are being distributed to stock at grass. The fact that so many farmers can say that they never bother about 'chits,' and have never experienced trouble, would appear to be explainable by the fact that animals at grass are not, as a rule, likely to consume large quantities of the tubers. Experience appears to support this idea. However, instances of most serious losses have been recorded as due to solanine poisoning, veterinary opinion laying the cause at the door of the chitted tubers, and the practice is certainly one that cannot be recommended.

The same remarks apply to the use of 'greened' tubers, and for the same reason. In Holland here, I find even less regard paid to 'greened' tubers than to 'chits,' although some farmers assert that they would much rather waste 'greened' tubers than feed them. The same farmers as often as not pay no regard whatsoever to 'chits.' Some farmers record cattle as being anything but partial to 'greened' tubers, and therefore will not consume them if they can help it. So far as the writer's experience goes, during the greater part of the year 'greened' tubers form such a small percentage of the whole that they call for no special attention. At some seasons of the year, however, there is a distinct possibility of this percentage reaching a figure that must be taken into account. With the coming of the warmer weather, and the freedom from fear of anything approaching a severe frost, say, in April, surplus and rejected tubers, destined for consumption by stock, as the clamps are turned over, are put aside. A light covering of straw may be thrown over them, or they are carted into some outbuilding and left uncovered and exposed to daylight, and under these conditions serious 'greening' often occurs. Again, when the early

potato crop is being lifted, say in June and July, the rejected stuff is more often than not thrown aside and left uncovered, exposed to strong sunlight, and then ultimately picked up and carted to stock.

In Black's 'Veterinary Dictionary,' edited by Miller, a useful account is given of potato (solanine) poisoning, its symptoms and its treatment. It is first pointed out that the potato belongs to a natural order to which belong a number of very poisonous plants. The tubers themselves are not usually considered dangerous to live-stock so long as they are wholesome, but the haulms and sprouted, diseased, old, or 'greened' tubers may give rise to poisoning. The tubers when sound are practically harmless unless taken in excessively large quantities, but even they contain a definite amount of solanine in the skin and eyes. When the tubers are boiled the alkaloid is dissolved out in the water and does no harm. If, under the action of sunlight, the tubers turn green, there is considerable risk attached to them as a food for live-stock. Where comparatively large stocks of 'greened' tubers are held for one reason or another, they should be boiled before use and the water strained away, or they may be distributed in small amounts amongst normal tubers. Old, rotten, frosted, or sprouted potatoes are also serious sources of poisoning. In most cases the potatoes need to be fed for some little time before symptoms of poisoning appear, but in other cases—particularly where large quantities have been taken—poisoning may appear rapidly.

The symptoms of potato poisoning are described. In the case of horses, staggering movements, loss of appetite, excessive thirst but inability to drink, constipation followed by foul-smelling diarrhoea, stertorous breathing, and a rapid pulse have been noticed. Death occurred quietly in some cases; in others there was distress. In the case of cattle there is an inability to rise, cessation of lactation, salivation, and vomiting in some cases, dryness of the muzzle, but no tympanitis (hoven), moaning, or grunting. Pigs have also shown loss of appetite, dullness, exhaustion, absence of perceptible pulse, watery diarrhoea, low temperature, and coma. The appearance of peculiar skin lesions in a number of animals fed on potatoes should always be looked upon with suspicion. When small amounts of solanine have been taken for some considerable time, loss of condition is noticeable in the animal.

As to treatment, individuals showing symptoms should be removed to comfortable quarters away from the rest of the animals. A drench, containing equal parts of strong black coffee or tea and linseed gruel, should be given at once, and followed by an oily or saline purgative. Where possible copious enemata of warm soapy water should be given, and

the back and loins should be rubbed with strong embrocation or other stimulating liniment. Above all, the feeding of any but entirely wholesome and sound potatoes should not be practised. Kellner further observes, relative to solanine, that scabby potatoes do not contain more solanine than sound ones, but that it has been noted that heavy dressings of nitrogenous manures cause the amount of the poison to increase.

In this area veterinary evidence shows that, in addition to poisoning from the use of chitted and 'greened' tubers, trouble arises from the use of diseased, rotting, and dirty tubers. The common rule is to feed anything that will not sell, and very seldom is any effort made to clean the tubers. All feeders are not offenders in this way, but certainly the majority are, and considering the scale on which potatoes are fed the amount of trouble that appears seems but small. If it were to occur evenly amongst offending feeders it would cause little concern, but it usually falls as a sort of epidemic on isolated individuals, clearing off a good many animals in a short time. The writer knows of two cases, one of which occurred several years ago and the other quite recently, where twelve horses and seven horses respectively were lost in a comparatively short time. The practice of feeding diseased and rotting material cannot be too strongly condemned, not only from the point of view of the consuming animal, but from the possibility of carrying or spreading diseases of the crop itself, since the spores of many serious fungus pests can withstand passage through the digestive tract, and even a very high degree of heat. The question of cleaning the tubers is another matter, since this entails a good deal of expensive labour, and a large number of feeders would certainly not be prepared to go to this expense. Generally speaking, tubers are not washed prior to feeding. In some cases washing is done before boiling the tubers for pigs, but this is not the rule. In the writer's experience, unless the potatoes are very dirty, the expense of cleaning cannot be justified. The writer has yet to meet or experience trouble where potatoes have been fed that were no more than 'ordinarily' dirty. On the other hand, the feeding of very filthy tubers cannot but be condemned, and veterinary evidence is available in the locality, as already stated, that serious difficulties have arisen from such a cause. Since washing is somewhat expensive in most cases, the simple method might be adopted of allowing the tubers and adhering soil to dry, after which they could be turned over, when a good deal of soil would be knocked off, and more would be knocked off in actually handling them for feeding. Then, in most cases, the tubers would be sufficiently clean.

The question arises as to whether to feed the tubers raw or cooked. In this area the bulk of the potatoes fed are fed

in the raw state. They are always so fed to cattle, sheep, and horses (very occasionally they are fed in a mash to horses), and both raw and cooked to pigs, but even in the latter case it is practically certain that the bulk is fed in the raw state.

Kellner observes that there is a certain dislike to feeding raw potatoes, due to the fact that they possess a peculiar acrid taste, and increase the flow of digestive juices in the stomach and intestines. Linton records an objection arising from the marked increase in the secretions of the salivary glands, resulting in stringy ropy saliva pouring from the mouths of cattle into the food troughs. This, he says, is a great nuisance in cow-sheds, and causes a great increase in the labour of feeding and tending the cattle, and for this reason many dairymen object to the use of raw potatoes. The writer has yet to meet an objection on these lines from a stock-feeder in the Parts of Holland. Kellner also observes that raw potatoes are thought by some to cause colic, purging, distension, lameness in young cattle and abortion in pregnant ones, and he further states that there is no doubt that when raw potatoes have been fed for a long time, or in large quantities, some of the above-mentioned disturbances have been observed; but if the daily supply is not too large, and some other suitable food is given, attention being paid to observe any injurious effects, then they may be used.

Generally speaking, the Holland farmer uses raw potatoes with impunity to most classes of stock. He is usually, but not always, careful of the amount he feeds to young stock and to horses, but to pregnant animals he pays no special concern. His chief trouble from the use of raw potatoes in cattle feeding is 'blowing,' as it is termed locally, by which is meant hoven, tympany, or distension. To a lesser extent he is troubled by choking, since he usually feeds the tubers whole. Huge quantities of raw tubers are used in the feeding of full-grown cattle, and once they have got well on to them, it is surprising what quantities such cattle will take without harm. However, the huge quantities fed cannot be justified, either from the point of view of sound rationing, or from the point of view of safety. Undoubtedly the 'hoven' that occurs is largely due to the excessive and wholly unjustified use of potatoes, and in some cases to the introduction of too large a quantity when commencing to feed potatoes. Generally the rule advanced by Kellner and others relative to the gradual introduction of potatoes into the ration, and also to the gradual cutting out of potatoes from the ration, is well known and well observed in this area. Other troubles, such as those mentioned by Kellner, except perhaps a little scouring at times, the writer has not come across as yet. It is stated that cattle (store cattle or cattle for finishing) from this area, where they are largely potato fed, meet but

a moderate trade in markets immediately surrounding the area. Definite reasons are not forthcoming, other than that they are regarded as not being good 'doers.' Potatoes, of course, are definitely laxative in effect, and such large quantities as are used in the feeding of cattle demand some attention to this point. One finds that the general practice adopted is to fatten bullocks on raw potatoes, dry fodder, and a liberal allowance of Egyptian cotton-cake. This latter is very often the only concentrate fed, although in other cases decorticated cotton seed meal is favoured, and on occasion even a little linseed-cake. This latter is used entirely for its promotion of bloom and finish, since, of course, it has no effect towards correcting the laxative tendency of the potatoes. Apart from the case of fattening bullocks, Egyptian cotton-cake is associated with the feeding of raw potatoes wherever permissible, and sometimes, it is feared, where it is not permissible.

As might be expected, cattle and sheep are least sensitive to the ill-effects of raw potatoes, and possibly the tubers are better used in this state with this class of animal, than in a cooked state, since it is certain that the ruminant is not partial to, nor is its general health improved by, the feeding of masses of stodgy food, such as cooked potatoes would represent. It is to be noted, however, that Kellner observes that a larger allowance of cooked potatoes than of raw potatoes could be given to cattle. In this area it is the invariable practice to feed the tubers in the raw state to cattle, and in this state also, when fed, to sheep. Kellner states that a fattening ox may be given 50 lb. per 1000 lb. live-weight, cows in milk 25 lb. per 1000 lb. live-weight, and dry cows in the last stages up to 40 lb. The tubers should be sliced, and there should be fed along with them some soothing food such as oil-cake, and a good supply of coarse fodder is necessary.

Feeding-stuffs which have an irritant effect on the digestive organs—rape-cake, malt coombs, molasses, silage—should not be fed at the same time. Linton limits the quantity of raw potatoes in the case of dairy cattle to 28 lb. per day, observing that full-grown fattening cattle in good condition may be given twice that quantity. Much larger quantities of raw tubers than these are fed to cattle of the description mentioned, in this area. A well-grown bullock will be brought up gradually to consume 6 to 7, or even more, stones per day, and dairy cows may be found getting anything up to 4 stones per head daily. Along with such an allowance of potatoes there is usually fed about 7 lb. per head daily of Egyptian cotton-cake, and straw, or straw and hay, *ad lib*. The tubers are used in the feeding of young stock, from weaning calves upwards, but in these cases careful control of quantity is exercised, and very often they are given to such classes

of stock in mixture with a few roots. The usual practice is to feed the tubers whole; some few feeders slice, but they form a small minority. It is much more common to slice the tubers if feeding them to young stock than for older stock. Choking occurs occasionally, but is not a really serious concern. As a rule the tubers are fed off the floor, being well scattered about. This is done as a precaution against choking, promoting quieter and less greedy feeding, but this practice is not universal, and in any case must have obvious and serious drawbacks. The writer knows several large bullock-feeders who, feeding up to 7 stones per head per day, always feed the tubers in mangers, and feed them whole at that. It is to be noted that it is not so much the very large or the small, as the medium tubers that are feared as a possible cause of choking, since the animal seldom tries to bolt the former whole, whereas it does attempt this with the medium-sized tuber. Again, of course, it is the greedy feeder that is always the more liable to choke. Generally speaking, the bulk of the evidence goes to show that if the tubers are fed whole they are then safer fed off the floor, and that if they must be fed in mangers they had better be fed sliced.

It has already been stated that the large allowances of potatoes fed cannot be justified either from the point of view of sound rationing or of safe feeding. If feeders were to use the tubers on more scientific lines they would not feed such large quantities, and there is ample evidence to show that they would not then suffer so much from 'blowing' or hoven. Hoven is, as might be expected from the excessive allowances fed, a fairly common difficulty that feeders have to face, and quite an appreciable number of cattle are lost as a result. Some farmers take the precaution of cutting down allowances somewhat if 'blowing' occurs, but the majority carry on as usual. In a bad case the vet. is sent for, and he usually relieves matters with the trocar; as often as not, however, the vet. is called in too late to save the beast. In less serious cases the farmer will undertake treatment himself, giving a dose of one pint of linseed-oil, or in some cases the animal is shut up and fasted, being dosed with $\frac{1}{2}$ lb. of cattle salts in one pint of water, and then gradually introduced to food again after twelve hours. In milder cases no notice is taken of the animals at all, beyond observation that the trouble does not get worse. 'Blowing' usually occurs pretty quickly after feeding, and it is often prevalent if the tubers are fed to beasts on rank growing grass. In any case, the best method of controlling hoven is to feed the potatoes in sure justifiable quantities—generally speaking, in quantities ~~scouring~~ of those mentioned by Kellner and already. It is stated till be found that such quantities are un- from this area, its of what can be used in accordance with

the sound construction of the ration. In cattle feeding raw potatoes are used as a root substitute, and it should be observed that they are of about twice as much value in feeding as roots—the starch value of potatoes is double that of roots,—and therefore 56 lb. of potatoes is easily the equivalent of 112 lb. of roots. The feeding of such an allowance as 1 cwt. of roots is not easily justified. The writer finds that he cannot, paying attention to the sound balance of the ration, include more than 30 to 40 lb. of raw potatoes per head daily in the ration for a bullock commencing fattening at two years old, and weighing about 9 cwt. He is fully satisfied that the practice of feeding double and treble that quantity merely results in slowing up the fattening process, since the animal does not digest as much of its food allowance as it could do, and should do, towards maximum progress, and that the practice results also in the conversion of potatoes, cake, and straw into 'muck,' and represents an extremely expensive method of making 'muck.'

If the requirements of an animal of a certain age and size amount to so many pounds of starch value, in correct balance, daily, then all that he is fed over and above that amount is fed to waste. As a matter of fact, in such a case as this it is an actual disadvantage, since the excessive feeding of starchy food will tend to lead to a lower utilisation of the ration as a whole. The type of bullock usually fattened in this locality is the two-year-old Lincoln Red Shorthorn, weighing about 9 cwt. at the commencement of fattening. Occasionally a three-year-old of the same breed is met with. The starch value requirements of these animals would be about $10\frac{1}{2}$ lb. daily at the commencement, increasing to 14 lb. towards the close of the fattening period in the case of the younger bullock, and about $\frac{1}{2}$ lb. of starch value extra throughout in the case of the older bullock, allowing in both cases for a daily live-weight increase of 2 lb. An allowance of 75 lb. of potatoes would in itself supply $13\frac{1}{2}$ lb. of starch value, and therefore an excess of that required by either animal in the earlier stages of fattening. Apart from this, however, the potatoes are exceedingly short of protein, and, although ample starch value would be supplied by such an allowance, the amount of protein supplied would be very far below that required by either animal. The addition of about half a stone of Egyptian cotton-cake would probably bring the protein supply of the ration up to somewhere near the animal's requirements. It would also, however, raise the starch value figure considerably, and the dry fodder fed—and animals fed liberally on raw potatoes eat considerable quantities of straw—would thus add further to the already excessive starch value figure.

A complete analysis of a common local ration gives figures

such as follows : Lincoln Red bullock, aged two years, weighing about 9 cwt., commencing fattening, receiving the following daily ration :—

	Starch Value.	Protein Equivalent.
Potatoes, 75 lb. (a comparatively moderate allowance)	13.50 lb.	.36
Oat Straw, <i>ad lib</i> (say 21 lb.) .	3.57 "	.20
Egyptian Cotton-cake, 7 lb. .	2.94 "	1.19
	20.01 lb.	1.75
Actual requirement about	11-12 lb.	1.50

Starch value and protein equivalent are both being supplied in excess, but starch equivalent particularly so.

The following are details of some rations recommended by the writer in certain specific cases, which he knows to have done satisfactorily, or to be doing satisfactorily. The rations are usually made up from the list of available foods supplied by the farmer when asking for advice. In each case the rations are designed for bullocks commencing fattening at two years old, weighing then about 9 cwt.

No. 1.

Per head daily—

Potatoes, 35 lb.

Oat straw, *ad lib*.

Decorticated cotton seed meal, 2½ lb.

Beans, 1 lb.

Dried beet pulp, 2 lb. (fed dry as a concentrate).

Oats, ½ lb.

A further ½ lb. of cotton seed meal is added towards the mid-fattening period, and a further 1 lb. of dried beet pulp at a still later stage.

No. 2. Seeds hay available.

Per head per day—

Raw potatoes, 28 lb.

Seeds hay, 10 lb.

Oat straw, *ad lib*.

Decorticated cotton seed meal, 2½ lb.

Dried beet pulp, 2 lb. (fed dry as a concentrate).

Adding towards the mid-fattening period ½ lb. beans and ½ lb. dried beet pulp, and still later 1 lb. of oats.

No. 3. Here the supply of potatoes was limited.

Per head per day—

Oat straw, *ad lib*.

Potatoes, 14 lb.

Dried beet pulp, 10 lb. (fed as a root substitute, soaked in water from ten to twelve hours prior to feeding).

Linseed cake, $1\frac{1}{2}$ lb.

Egyptian cotton-cake, $3\frac{1}{2}$ lb.

Adding towards the mid-fattening period $\frac{1}{2}$ lb. linseed-cake, and later on a further $\frac{1}{2}$ lb. of dried sugar-beet pulp, this time dry, as a concentrate.

No. 4. Represents a greater use of potatoes.

Per head per day—

Potatoes, 40 lb.

Oat straw, *ad lib.*

Decorticated cotton seed meal, $3\frac{1}{2}$ lb.

Adding towards the mid-fattening period $\frac{1}{2}$ lb. of cotton seed meal, and later on 1 lb. of dried sugar-beet pulp as a concentrate.

Where roots are available these are freely combined with potatoes in the feeding of all classes of cattle, and the writer recommended the following ration for finishing some strong bullocks :—

Per head per day—

Potatoes, 20 lb.

Mangolds, 30 lb.

Oat straw, *ad lib.*

Clover hay, 7 lb.

Bean meal, 1 lb.

Cereal meal, 3 lb.

Egyptian cotton-cake, 1 lb.

Decorticated ground-nut cake, 1 lb.

Big strong bullocks are quite frequently fed out on a heavy ration of potatoes, plus straw and probably a little hay. Usually it is well-grown three-year-old bullocks which are so fed, and inquiry elicits, what would probably be expected, that the fattening process is slow.

The breeding of cattle is not a feature of this area, but where it is done the calves are usually suckled by the cow; the cows, both before and after calving, are liberally fed with potatoes. Apparently no ill-effects have been recorded on the pregnant animal, although when advice is asked for caution is always given as to the use of potatoes in the case of such animals.

Here is a ration recommended for suckling cows for maintenance purposes.

Per head per day—

Potatoes, 20 lb.

Seeds hay, 10 lb.

Oat straw, *ad lib.*

Beans, 1 lb.

Adding a little concentrate production mixture according to any obvious requirement.

In the case of young cattle very few potatoes are advised: 11 to 12 lb. per head per day, fed sliced at six months, increasing to 20 to 21 lb. per head per day at twelve months, along with good fodder, and suitable concentrates in adequate amount.

A ration that was recommended for eight-month-old beasts was—

Per head per day—

Clover hay, 11 lb.

Potatoes, 11 to 12 lb.

Decorticated ground-nut cake, $1\frac{1}{2}$ lb.

Crushed oats, $\frac{1}{2}$ lb.

Bean meal, $\frac{3}{4}$ lb.

and a ration for twelve-month-old beasts—

Per head per day—

Potatoes, 20 to 24 lb.

Oat straw, *ad lib.*

with something like 5 lb. per head per day of the following mixture of concentrates—

Beans, 2 parts by weight.

Oats, 1 part by weight.

Decorticated cotton seed meal, 1 part by weight.

Decorticated ground-nut cake, 2 parts by weight.

Dried sugar-beet pulp, $\frac{1}{2}$ part by weight.

These beasts were intended for the butcher, and were being kept going.

There are a number of small dairy herds in Parts of Holland, chiefly situated around the towns, where in some cases potatoes are used extensively in the feeding of the cows. In other cases they are not available at all. Where available, however, they are used in very heavy quantities. Several maintenance rations have been advised which have included potatoes. Two typical examples are:—

No. 1. Per head per day—

Raw potatoes, 20 lb.

Pea straw, 20 lb.

Dried beet pulp, 1 lb. (fed dry as a concentrate).

Decorticated ground-nut cake, $\frac{1}{4}$ lb.

No. 2. Per head per day—

Raw potatoes, 20 lb.

Seeds hay, 10 lb.

Oat straw, 10 lb.

Beans, 1 lb.

In both cases a separate production ration was used in conjunction with the maintenance ration.

Boutflour recommends the use of potatoes in the production ration—but not in the maintenance ration,—limiting the total quantity of the tubers to 16 lb. per head daily. Assuming the accepted value of 4 lb. of potatoes is the equivalent of 1 lb. of cereal meal, and balancing with a highly protein food, 8 lb. of potatoes + $1\frac{1}{4}$ lb. of decorticated ground-nut cake supply the requirements for the production of 1 gallon of milk. This combination may be used up to the extent of the production of 2 gallons of milk. The effect of potatoes on the butter fat must be noted; this is to produce a hard butter fat, and also to increase the whiteness of both milk and butter. Wallace, in his 'Farm Live Stock of Great Britain,' observes that potatoes, like mangels, produce a pale milk, which looks poor in quality and unattractive to the consumer. M'Candlish, in his book 'Feeding of Dairy Cattle,' observes that too large quantities of potatoes will result in a butter of poor flavour, and he limits the daily allowance per head to 20 lb.

Sheep-farming holds but a very small place in the agriculture of this part of Lincolnshire, but occasional inquiries are received relative to sheep. Potatoes are fed to sheep to some extent, usually being carted out to the flock on grass. The tubers are always fed raw and whole. As the number of flocks is so few, and the use of potatoes in the feeding of the sheep is not extensive, further information as to amounts used, and other experience in their use, is not forthcoming. It is well to note, however, that Kellner states that sheep can take raw potatoes almost as well as cattle, and should be given up to 25 lb. per 1000 lb. live-weight, or when fattening they might receive up to 40 lb. per 1000 lb. live-weight.

Horses are more sensitive than ruminants to the effects of raw potatoes. The quantities used for horses should therefore be very limited. Kellner observes that 3 to 5 lb. per head per day have a beneficial effect on the general condition, while slow-working horses can, under careful supervision, be given up to 12 lb. per day per 1000 lb. live-weight.

Linton puts the limit at 6 lb. per day, observing, however, that in some districts it is customary to give much larger quantities without apparently causing any harm. Potatoes are fairly extensively used in the feeding of horses in this district, and, generally speaking, much larger quantities are fed than those cited by Kellner and Linton. The best feeders are very cautious regarding the use of potatoes for horse feeding; some never use them, and others use them occasionally in small quantities. One farmer used them occasionally after cooking. Usually, however, the tubers are fed raw and whole, and anything between 25 to 30 lb.

per head per day would appear to be the average quantity fed. Greater allowances are given in some cases. The writer knows of one extreme case where 6 stones per head per day are fed. It has been suggested to the writer by some farmers that potatoes have a 'weakening' effect on horses, leading to heavy sweating at work. It is to be noted that the most severe of the recorded cases of loss from potato poisoning (solanine poisoning) have affected horses.

The potato is probably better known throughout the country as a pig food than as a food for any one other kind of domestic animal. Generally speaking, it has a fairly well-established value as a food for this animal. In the Parts of Holland practically every farmer maintains a herd of pigs, often with the express purpose of consuming chat and surplus tubers. The practice is to grow strong stores, say, up to five months old, or buy such pigs in, to be ready for the time when the tubers are plentiful—that is at the back-end of the year. These pigs are then fed very liberally with potatoes, more often than not in the raw state, thrown broadcast into the yards, plus some quantity of barley meal. The animals are grown to a big weight, and they feed slowly. Breeding stock and youngsters are also fed liberally with raw tubers, with the addition of sharps and some barley meal for adults and stronger stores. Frequently the tubers are boiled or steamed for fattening pigs and for suckling sows, but only in a few cases are they cooked for all classes of pigs. In a good proportion of cases attention is now paid to the balancing of the ration. Fish meal, meat and whale meal are all in use as a source of protein. Some farmers are convinced of the enhanced feeding value of cooked potatoes, particularly in the case of fattening pigs. Many consider cooking far too much trouble, without really weighing up the case for and against. Others argue that the cost of cooking runs away with the value to be derived from the increased feeding value of the tubers obtained as a result of cooking. The whole position calls for a clear statement of all the points involved. Kellner states that raw potatoes should not be fed to pigs, the starch grains of the potato being of a relatively large size. Linton observes that, owing to their size, the starch grains are not easily digested when raw, except by herbivora (*e.g.*, cattle, sheep, horses), so that it is necessary to cook the tubers for omnivorous (*e.g.*, man and pig) and carnivorous animals. Occasionally, however, Linton adds, a few raw potatoes may be given to pigs with advantage. It is certain that the animals relish them in moderate quantities, a relish probably arising from a craving for succulence and vitamins in the case of sty-fed pigs.

As to the comparative value of cooked as against raw potatoes, Porter, in his 'Stockfeeder's Companion,' records

the result of an experiment reported by Professor Brynner Jones. The average daily ration fed consisted of $2\frac{1}{4}$ lb. of potatoes, 2 lb. mixed barley and maize meals. The rations were fed cold along with water. (The experiment was reported in 1907-8, and it is probable that a much different type of pig would be in use then from that in use now.

The results were as follows :—

	Live Weight Increases.	
	Cooked Potatoes.	Raw (Pulped) Potatoes.
<i>1st Experiment—</i>		
5 Pigs fed for eight weeks .	154 lb.	123 lb.
<i>2nd Experiment—</i>		
5 Pigs fed for six weeks .	127 "	108 "
Total live weight increases	281 lb.	231 lb.

Porter suggests that the increased live-weight gain resulting from the use of cooked potatoes is not sufficient to meet the cost of cooking. A. D. Wilson, then Superintendent of the Minnesota University Farm, writing in 'The Minnesota Farmers' Institute Annual, No. 32, Potato Number, 1929,' also assumes the cost of cooking potatoes will be fully equivalent to the gain in feeding value. The writer has investigated this point, and he finds that the cost of steaming varies between 3s. 9d. per ton and 6s. 6d. per ton, according to the amount of preparation called for before the tubers are cooked. These figures demonstrate that the cost of cooking is really no serious item.

Porter also observes with regard to this experiment that Professor Jones had the cooked potatoes fed cold, and it is possible that the good results attributed to cooked potatoes are largely due to the practice of mashing the cooked potatoes up with meals, and feeding the mixture 'warm.'

In the case of the pig the potatoes must be regarded as a meal substitute, and as such as a substitute for the usual fattening meals—barley, maize, &c.,—that is, as a substitute for the carbohydrate meals. Danish workers have shown that 4 lb. of cooked potatoes are equal to 1 lb. of barley meal. Some workers give a higher value to cooked potatoes, recording 1 lb. of cooked potatoes to be the equivalent of $1\frac{1}{4}$ lb. of raw potatoes. Henry and Morrison report, from experiments with swine recorded in "Feeds and Feeding," that $4\frac{1}{2}$ to $5\frac{1}{2}$ lb. of raw potatoes are required to take the place of 1 lb. of maize, and that from $3\frac{1}{2}$ to $4\frac{1}{2}$ lb. of cooked potatoes will take the place of 1 lb. of maize. These figures of Henry and Morrison's agree closely with the Danish figures, and the Danish figures are generally adopted now when the question of substituting meal by potatoes arises.

This raises the question, apart from chats and unsaleable material, at what figure does it become a good, or a better, proposition to feed potatoes to stock, rather than buy in carbohydrate foods? In the case of pigs, where the potatoes are cooked, 4 tons of potatoes = 1 ton of barley meal. This means that the total value of 4 tons of potatoes—reckoning delivery costs if they must be purchased, and about £1 for cooking—should be something just under the price at which barley meal can be purchased on the farm. Where the tubers are fed raw, 5 tons of potatoes = 1 ton of barley meal, and the value, or price of these on the farm, cannot touch by a little margin the price of 1 ton of barley meal on the farm. In considering the matter it must also be remembered and accounted for, in the estimate, that the feeding of the crop to stock on the farm cuts out riddling and delivery costs that would have been entailed in marketing the crop in the ordinary way, while on the other hand it entails some little extra expense in actual feeding.

The writer undertook, two years ago, an experiment to determine the economical amount of potatoes (steamed) that can be introduced into a balanced ration for fattening pigs. Full results are reported in the 'Journal of the Ministry of Agriculture' for June 1930, and in a report published by the Kirton Agricultural Institute (in course of preparation). The essential results were as follows. Four pens of pigs were put up. No. 1 Pen acted as a control, and was fed throughout on a balanced ration of meal only. In the case of the other pens, increasing quantities of barley meal were replaced by potatoes at the rate of 4 lb. of potatoes for every 1 lb. of meal replaced; No. 2 Pen had $\frac{1}{3}$ rd of the barley meal, as used in the control ration, so replaced; No. 3 Pen had $\frac{2}{3}$ rds; and No. 4 Pen had all the barley meal replaced by potatoes. The following table shows the essential figures of the results obtained:—

Pen.	Live-Weight Gain per Pig.	Cost of Food per lb. of Live-Weight Gain.	Carcass Placing, as Judged by Expert Curers.
1	177½ lb.	6·06 pence	4th
2	165 "	5·57 "	3rd
3	152¾ "	4·51 "	2nd
4	157½ "	3·60 "	1st

No. 1 Pen made the best live-weight gain, and finished up full of bloom and of good appearance, which no other pen came up to; but, at the same time, it worked out the most costly increase per lb. of live-weight, and the carcass quality was the lowest.

The results demonstrate that potatoes can be used with

advantage to replace entirely starchy meals in rations for fattening pigs; that they have, if anything, an improving effect upon the carcase quality. Above all, chat tubers, such as were used in the trial, have a drastic effect in reducing feeding costs. When the trial was undertaken it was thought that the large use of potatoes would prove uneconomic, and that the bulk of the ration would prove too great to permit of an economic rate of live-weight gain. The results show, however, that the pig is quite capable of making good use of bulky material, so long as that bulk has nothing more difficult to deal with than water, and that the food is otherwise well-fitted to the animal. In this connection some remarks by Funk, in his book 'The Vitamines,' are interesting. Under the heading 'Potatoes' he states that, "although large quantities must be used because of the great dilution of the more valuable components present, it seems to be certain that this dilution is harmless to people." Funk further recognises the great nutrient value of potatoes in human feeding.

It must also be remembered that Kellner's figures, relative to the digestion of potatoes by the different farm animals, show pigs to have an extremely high power of digestion in regard to this food. It is very likely that the average starch value figure of 18 per cent usually adopted, which is presumably the average arrived at from work on cattle, is too low for pigs.

The recorded live-weight gains in the experiment were very much closer than was expected. It demonstrates the good food value of potatoes in the case of pigs. A point also arises that the substitution of potatoes for barley or maize meal introduces a food of much wider albuminoid ratio than those which it replaces. It must thus automatically widen the ratio of the whole ration, and somewhat upset the optimum balance. It would therefore appear advisable, when introducing potatoes into a ration as a replacement of meal, that the protein foods should be slightly increased to maintain the balance. It is suggested in the above experiment that, if this had been done, the live-weight gains recorded might have been much closer than they were.

Kellner records that potatoes when cooked form a tasteless non-irritant food, and even in this form they can easily upset the digestive organs. The water which is drained from the potatoes after cooking should not be used. Salt should be added to the tubers to make them more palatable. The Holland feeder usually drains off the water prior to feeding. It is, however, most unusual for salt to be added.

The writer has no records of trouble arising from the use of potatoes, in any condition, to pigs. The question of feeding

'greened' potatoes to pigs has arisen. In this case it has been advised to cook the tubers, pouring off the water. The tubers would then become safe to use.

The following are some rations recently recommended :—

For suckling sows.—A mixture as follows :—

$\frac{1}{2}$	cwt.	Fish meal.
1	„	Extracted soya meal.
2	„	Barley meal.
$3\frac{1}{2}$	„	Sharps.
1	„	Maize meal.
1	„	Crushed oats, using 1 cwt. of steamed potatoes with every 9 cwt. of meal.

For Newly Weaned Pigs.—The mixture, as for suckling sows (except that the oats are replaced by half sharps and half barley meal), is recommended up to the age of three months, when a slight increase in the quantity of potatoes is advised, the meal mixture being slightly adjusted as follows :—

$\frac{1}{2}$	cwt.	Fish meal.
1	„	Extracted soya meal.
$1\frac{1}{2}$	„	Sharps.
$1\frac{1}{2}$	„	Barley meal.
$\frac{1}{2}$	„	Maize meal.
8	„	Meal to be used with 12 cwt. of steamed potatoes.

For pigs over four months old, and up to the finishing off period, one or other of the rations set out in the following tables might be used, choice depending upon the quantity of potatoes available. The more potatoes available the less costly the feeding :—

	Col 1	Col 2	Col 3
Extracted Soya Meal	$\frac{1}{2}$ cwt.	$\frac{1}{2}$ cwt.	$\frac{1}{2}$ cwt.
Sharps	$4\frac{1}{2}$ „	5 „	$5\frac{1}{2}$ „
Barley Meal	5 „	$2\frac{1}{2}$ „	$1\frac{1}{2}$ „
	10 cwt.	8 cwt.	7 cwt.
Steamed Potatoes	.	8 „	12 „

Such mixtures as these may be fed to empty and in-pig sows. In the case of the latter, the potatoes fed should be gradually decreased in amount so as to reduce the bulk of the ration and allow plenty of room for the developing piglings. Until about 1 month prior to farrowing the in-pig sows should be given the suckling sows' mixture. To

save expense the potatoes may be fed raw to pigs of this type, and also to the stores for which the mixtures are particularly made up. Unless the pigs have a free range, as is desirable, the use of a mineral mixture with these mixtures is advisable.

In the case of finishing pigs one of the mixtures in the following table was recommended :—

	Col 1.	Col. 2.	Col 3	Col 4.
Barley Meal	6½ cwt	4 cwt	2½ cwt.	1 cwt
Sharps	3½ "	4 "	1½ "	5 "
Steamed Potatoes	10 cwt.	8 cwt.	7 cwt.	6 cwt
	...	8 "	12 "	16 "

In the feeding of poultry, potatoes were used very extensively in this area, but to-day they are not utilised to anything like the same extent. The tubers were used in the raw state, and the fowls suffered seriously from scouring. The Kirtou Agricultural Institute authorities set themselves against the practice, with the result that it has been reduced very considerably. The Poultry Instructor attached to the Agricultural Institute (Mr G. H. Read) expresses the opinion that potatoes, in small quantities, are valuable for poultry feeding, but they should be cooked. It was noted on the Agricultural Institute farm that a fall in egg production followed the discontinuance of the use of potatoes. Linton advises the use of boiled potatoes in the feeding of all classes of poultry.

As indicated in an earlier part of this article, it happens very often that a surplus of potatoes occurs in the late spring and early summer. Such a position has occurred many times. In 1929 large stocks of potatoes were left on hand on the farms. When this occurs tremendous wastage results, as it is impossible to consume these stocks through the medium of live-stock. The need is felt for some means of preserving the tubers until the advent of the next close-feeding season. The present tendency is for farmers to keep using these stocks throughout the summer, and some even try to keep them over, in the ordinary clamp, until the following autumn. The tubers deteriorate rapidly as the summer advances, chitting badly, shrivelling, and obviously becoming of much reduced value. Veterinary records show that the feeding of these old tubers, quite apart from the question of chits, which is in itself a serious one, is a practice that cannot be recommended, and one that leads to much trouble.

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Kirton Agricultural Institute, describes a method adopted by Dutch farmers of ensiling their surplus tubers. This method has been practised by one or two farmers—on an experimental basis—in this area, and has proved successful. The ensiled material is proving of excellent value in the fattening of cattle. The method consists of the ensiling together of green clover, or 'seeds,' and the potatoes. A clamp silo has been used in this area, the materials being ensiled in successive layers, first a layer of clover and then a layer of potatoes, and so on, finishing off with a layer of clover, covering the whole with a little straw, followed by a thick coating of earth. During the process of building, a large amount of pressure is applied, the carts being run over the heap continually. The potatoes are ensiled whole, coming out in the same state, although they are much flattened by the pressure. The flesh is brown in colour, perfectly sound and wholesome, and appears to be semi-cooked. Cattle are very fond of the material. The presence of clover, &c., in this silage tends to make the material more or less unsuitable for pigs. Need is felt for some means of *ensiling* the tubers alone. The following is a method described by H. G. Larren in the 'Minnesota Farmers' Institute Annual, No. 32, Potato Number, 1919,' as being his own practice. The outfit required consists of tubs, a root-cutter, and maize meal. A day or two before making the silage, maize meal is put into a tub, water being added to saturate thoroughly the meal, but not sufficient to render it sloppy. This is allowed to stand in a warm place to ferment; it will then look and act like yeast. This is its function towards the making of the silage. Use whole, sound, and clean potatoes, and run these through the root-cutter. Put about a bushel of the sliced tubers into the bottom of a barrel, then a little of the fermented maize meal, and so on until the barrel is full, packing down well all the time. The tighter the packing the better. Put a board on the top—inside the barrel,—and weigh it down. In about three weeks the material is ready for use.

In the July 1929 issue of the 'Scottish Journal of Agriculture,' a Dutch method of preserving potatoes in the form of silage is described. By this method the potatoes are first washed and then steamed. The steamed potatoes are pressed firmly into a pit in the ground so as to exclude air, and then they are covered with a layer of earth. It is essential to steam the potatoes in as little water as possible, and to pour off the water before packing them in the pit. The pit used is about 3 feet deep by 3 feet wide. It is imperative that the potatoes be firmly pressed and packed so as to exclude air. The feeding value and flavour of the potatoes are but little affected by the process, and they will keep in the pit for years.

As a final word it can be stated that in the Parts of Holland, Lincs., potatoes are regarded as a first-class and a comparatively safe food for live-stock, whether used in the raw or the cooked state. As already stated, they are used very extensively, thus establishing their value and comparative safeness as a food. In the writer's locality, however, they are not, as a rule, utilised to the best advantage, being used *ad libitum* without any definite attempt to balance the ration. They are fed in quantities, and used indiscriminately as regards condition and type of stock fed. This cannot be justified from any standpoint, as it certainly exceeds the bounds of safety.

Note.—The three methods described of preserving surplus tubers have been tested at the Kirton Agricultural Institute this spring, and have been shown to be successful, and the material produced to be of first-class feeding value. Further details may be had by application to the Principal.

MANURING OF CROPS IN DUMFRIES AND GALLOWAY.

By JOHN GILLIES, N.D.A., N.D.D., Cummertrees, Annan.

THE counties of Dumfries, Kirkcudbright, and Wigtown present a wide variety of soils and a wide range of agricultural practices. Each county has its own problems of stock rearing, and cultivation and manuring of crops, and yet there is a general similarity about the three. Climatically there is no very marked difference from Carlisle to the Mull of Galloway. The great mass of the arable land, including some considerable areas of permanent pasture, is influenced by the same climatic conditions. Generally speaking, the climate of the Solway area is mild and moist, and not subject to serious winter frosts. All the main rivers run approximately due south into the Solway; and deeper into the glens—Esk, Annan, Nith, Urr, Dee, Cree, and Luce—a more rigid winter climate is experienced, but the winter climate of Dumfries and Galloway cannot be considered severe, or the summer climate subject to very troublesome fluctuations.

Topographically there is considerable variation. Kirkcudbrightshire is essentially a county of hills and glens, often high hills and narrow glens, and wherever there is any considerable area at a relatively low elevation the best land is often badly "broken," or full of outcrops of rock. Some alluvial land at the mouth of the river Cree, some along the river Dee, and some in the parish of Kirkbean are practically the only areas of "unbroken" land in the county.

To the west of it lies Wigtownshire, low in elevation but never flat, and always more or less "broken." Only one or two points in the whole county reach an elevation of 500 feet or more, and most of the arable land lies below 250 feet. Much of the Machers is very severely "broken," but outcrops of rock are less numerous in the Rhinns. The only considerable area of unbroken land in the county lies between the towns of Wigtown and Garlieston, and some of this is about the most fertile land in the south-west of Scotland. The "broken" soils of Kirkcudbright and Wigtown are light in texture and kindly in nature, and the best of them are very fertile and well suited for permanent pasture.

Some of the soils of Dumfriesshire, the most easterly of the three counties, are influenced by geological formations that do not appear in the other two counties. The underlying red sandstones show their influence in the Dumfries, Annan, and Lockerbie districts, and give a kindly but rather hot red soil fairly free from stones. Small areas are affected by underlying limestone. There is no limestone in Galloway. The glacial drift that covers most of the south of Scotland is of a relatively light stony nature in Galloway and Western Dumfriesshire, but on much of the east side of the county it is of the true boulder-clay type. The cold, retentive, and late nature of these boulder-clay soils is well exemplified in the parishes of Canonbie and Half Morton. Many of these stiff clay soils are distinctly "black-topped." Upper Nithsdale has also a considerable amount of true boulder-clay soil. Dumfriesshire is naturally more an arable county than the other two, but it does not follow that it is either more extensively or more intensively cultivated. In these remarks the purely pastoral aspect of the three counties has not been considered.

The artificial manure industry, as we know it, had its origin about the year 1840. Round about that year nitrate of soda and Peruvian guano were first introduced into Britain, and the processes of manufacturing superphosphate and dissolving bones were patented. Kainit from the German mines arrived about twenty-five years later. Shortly after the introduction of potash the practice of making compounds grew up. In the late '80's basic slag and sulphate of ammonia came into use. The present century saw atmospheric nitrogen combined for use as a fertiliser, and also the great development in the use of raw mineral phosphate and ground limestone. Modern methods of manuring have been evolved as the artificial manure industry has developed in scope and variety.

Previous to 1840 the main, practically the only, substances used for soil improvement were lime and bones along with the dung made on the farm. In these far-away days the transport of lime must have been a slow and laborious job in districts where lime-kilns did not exist. The difficulties of transport would not be so marked in the case of bones, because the amount transported would be relatively small. The great oil crushing industry and other industries that supply the modern farmer with such quantities of concentrated feeding-stuffs, and our import trade in grain, had not then been developed, so the dung made must have been sadly lacking in fertilising value. The circulation of fertility from the soil to the crops, from the crops to the stock, and from the stock back to the soil, must always have been attended by a certain amount of loss, unless fertilising material from an outside source, like

bones or purchased feeding-stuffs, was introduced, and it says something for our agricultural forefathers that so much of the land was still fertile in the middle of last century. Nevertheless much land had been slowly but surely depleted of its fertility, especially the more distant fields on each holding, and no doubt intensive grain-growing previous to the repeal of the Corn Laws had accelerated the process. Much of this grain-exhausted land is still, after many years, a blot on the agricultural landscape. If not exactly derelict it is nearly derelict, and its improvement has never been a more doubtful economic proposition than at the present time.

The introduction of Peruvian guano must have given a stimulus to soil improvement. It was a great factor in opening the mind and stimulating the latent energies of many farmers. If not exactly well balanced, according to modern ideas, it was rich and potent, and its effect was often quite spectacular. Although inclined to be forcing it could not be called exhausting, and, in nine cases out of ten, its use must have resulted not only in greatly increased crops, but in a visible permanent improvement of the soils on which it was used.

Previous to the development of the artificial manure industry the farmers of the south-west of Scotland pinned their faith on bones, and their liking for that manure has continued down to the present day. It still holds an important place in spite of its relatively high price and the proved effectiveness of its great modern rivals, basic slag and mineral phosphate.

Galloway was, by nature, intended for a grazing district, and the proportion of pasture has always been high. For pasture there is no more effective manure than bones, and the fine feeding pastures of Kirkcudbright and Wigtown were largely built up on the rough bones extensively used seventy or more years ago and the finer grists of bone meal applied in more recent times. Dumfries was more a cropping county, and did not show the fertilising value of bones quite so markedly.

For the cropping land, however, the newer and more active manures had forced themselves on the farmer's attention. About 1850 Thomas Biggar, Dalbeattie, began his career as a manure merchant, and some years later developed his business as a manufacturer of dissolved bones, superphosphate, and compound manures. There were many distributors, but as far as the writer knows the firm of Thomas Biggar & Sons has been the only manufacturer, as distinct from distributors, in the three counties under review. Dumfries and Galloway has always been well catered for in the way of manures. It is the business of every manufacturer and distributor to make and sell manures of a guaranteed composition, but the

Dalbeattie firm has excelled in the physical condition of its manufactured products. It was probably also the first firm to realise the necessity for, and put into practice, grinding bones to a very fine grist. The agriculturists of the extreme south-west owe a debt to that pioneer firm in the manure industry.

It is not easy for a present-day writer to visualise completely the manuring methods of our grandfathers and great-grandfathers, nor is it very important to do so. The interest is largely historic and academic. All knowledge and experience is valuable; and although manures change and become more varied and methods change, the essence of past knowledge and experience remains with us a valuable heritage. There is a danger of a writer becoming too parochial by laying undue stress on practices or methods that have an application far wider than he is aware of in his limited experience.

This article, however, is not a review of the past but rather a guide for the future. Modern scientific knowledge and recent research have widened our outlook in the application of science to practice. It is now realised that soil fertility is not altogether a question of liming and manuring. Intimately associated with these is the question of developing a proper bacterial flora within the soil, and only when this latter object is achieved can soil husbandry be considered good. Soil bacteria, however, are not visible objects: they are cryptic, and leave much to the imagination, and make little appeal to the practical farmer. We know that they exist, and that very few of the natural phenomena occurring in the soil are independent of their action. We can guess that the great group, or groups, of organisms which must be associated with a fertile soil must be very different from the group, or groups, of organisms associated with an infertile soil. The scientist working in the laboratory has proved the truth of this: the practical man can only guess at the truth by observation of the results of his operations.

What is the best indication of true soil fertility? A soil that will either grow good permanent pasture, or a soil that will grow rotation pasture that improves as it lies. The growing of good rotation crops does not necessarily imply a truly fertile soil, because rotation crops can be largely grown at the expense of applied manures; but applied manures do not always assure that a pasture which has to lie two or more years will continue good. Far from it. In Dumfries and Galloway the production of pastures that will progressively improve is one of the most elusive of agricultural intentions. Yet it can be done, and the farmer who acknowledges that his land will not lie in grass should reconsider his whole system of soil husbandry.

Its uneven surface contour and naturally moist climate make the south-west a grazing rather than a cropping district. It has little affinity with the more level and dryer east. Stock rearing and dairying are fairly evenly mixed throughout the whole area, and both necessitate a considerable amount of pasture. It is true that potatoes have not always been so unremunerative as they are at present, but it is only in the neighbourhood of Dumfries, Annan and Lockerbie, that potatoes are grown to any extent. The feeding of sheep on turnips has been a fairly remunerative branch of farming since the war, but the growing of grain has not been remunerative, and in many cases cropping is only practised as a means of securing the necessary winter keep for stock. Good pasture is the stand-by of the farmers in the south-west, and a wide rotation with plenty of grass, temporary or permanent, is his *sine qua non*. The whole system of manuring then should have as its final aim the production of good pasture, and good pasture denotes a soil truly fertile.

Notwithstanding the great advance in the technical knowledge of the average farmer, there is still too much manuring done in a haphazard way. Generally speaking, the scheme of cropping to be followed is quite definite, the ordinary rotation being oats, green crop, oats, and hay, with as many years' grass as possible. The scheme of manuring ought to be equally definite. Farmers would find it a distinct advantage to formulate a complete scheme of manuring for the coming season before any manures are purchased. By adopting this practice they would know weeks ahead not only the kind of manures they required but the total amount of each kind. The following is an illustration of a manuring scheme for an imaginary farm. The manuring of crops is not an exact science; and if the different mixtures are mixed on the farm, it is a simple matter so to adjust the quantities that the total amount of each manure required makes exact tons, or half-tons, as the case may be. In the scheme given there are no odd hundredweights of any manure, except in the case of sulphate of potash.

SCHEME OF MANURING.

	Super-phosphate	Mineral Phosphate.	Basic Slag.	Kainit	Sulphate of Potash.	Sulphate of Ammonia	Nitro Chalk.	Totals	Quantity per acre.
	cwt.	cwt.	cwt.	cwt.	cwt.	cwt.	cwt.	cwt.	cwt.
10 acres Len Oats . . .	10	10	..	20	..	8	..	48	4.8
12 „ Redland Oats . . .	..	70	..	..	..	..	..	70	5.8
9 „ Swedes . . .	24	36	..	20	..	9	..	89	9.9
2 „ Potatoes . . .	6	4	..	..	4	3	..	17	8.5
10 „ Hay (seeds) . . .	..	..	80	20	..	..	10	110	11.0
17 „ Pasture . . .	..	100	..	70	..	..	20	190	11.2
60 acres Totals . . .	40	220	80	130	4	20	30	524	

Summary : 2 tons 30 per cent Superphosphate.
 11 „ 58-62 per cent Mineral Phosphate.
 4 „ 30 per cent Basic Slag.
 6½ „ 14 per cent Kainit.
 1 „ Sulphate of Ammonia.
 1½ „ Nitro Chalk.
26 „ Total.

4 cwt. Sulphate of Potash.

The green-crop break is the most important from the manuring point of view. So long as the manure, or mixture, used is judiciously balanced it is very unlikely that that crop will be spoiled by over-manuring, and it is on the green-crop break that the farmer has his best opportunity of building up the general fertility of his land. Great improvements are often effected by top-dressing, but it is well to remember that the plant roots penetrate into the soil, you want them to penetrate into the soil, and that the manures should be where the plant roots are. This applies equally to lime, or limestone; but any form of lime has a natural tendency to sink in the soil, and for that reason it is usually kept as near the surface as possible. Lime or manures applied to the green crop become very thoroughly incorporated with the soil.

At one time in the south-west of Scotland it was a common practice to manure on the green-crop break for the whole rotation. The turnips, &c., would get from half a ton to one ton of bones (rough bones in the early days) along with some more active fertiliser, and that sufficed until the field was in green crop again. According to modern ideas such a system of manuring is economically unsound; and probably it is, as economic conditions are greatly changed, but at that time it was the sound practice of the best and most successful farmers.

Attempts to manure land according to the "law of diminish-

ing returns" has never proved successful when judged over a lengthened period of years, and the farmer who tries to grow each crop on the minimum amount of manure likely to assure a good crop has generally failed, both agriculturally and financially. On the other hand, the farmer who manures more lavishly, if with less economic forethought, is generally successful, both agriculturally and financially. In the former case the land appears to become poorer and poorer with each rotation, until it reaches a state of hopeless infertility. In the latter case the land usually is obviously fertile, and the farmer obviously prosperous.

Before going on to the manuring of crops in detail, it may be useful to explain some of the more evident functions of the manurial ingredients in plant nutrition, because the balancing of manures is based on certain nutritional facts that are well established.

Nitrogen is mainly associated with vegetative growth. There can never be full vegetative growth if nitrogen is deficient, and there can never be a full yield if vegetative growth is stunted. It requires a robust straw to carry sixty bushels, or more, oats per acre. A big crop of main-crop potatoes is never expected unless there is a full cover of shaws. Generally speaking, a full leaf on roots is a preliminary to a full crop, and in the case of cabbage and kale vegetative growth is all that matters. The same may be said of hay, but care has to be taken that hay is not grown too soft. Any excess of quick-acting nitrogenous manures is not retained in the soil permanently; and as nitrogenous manures are expensive, the farmer wants to use sufficient but never more than sufficient. Considerable judgment is required to estimate what is likely to be a sufficiency for the various crops often growing on widely different types of soil.

Phosphatic matter, no matter from what source it is derived, is the most important manurial ingredient. No land is ever truly fertile if deficient in phosphates, and of all the manurial ingredients it is the one most potent in giving quality to the crops grown. It is found in the living matter of the plant cell, and largely in the reproductive organs, hence it has an important bearing on grain formation. Active phosphates assist in root development in the early stages of plant growth, and hasten maturity in the later stages. In all probability it plays an important part in the development of a desirable bacterial flora in the soil. Its obvious beneficial effect on soil fertility can hardly be fully explained on any other hypothesis. It is never plentiful in any soil, and, unlike nitrogen, there is no natural available source from which the soil can recuperate itself.

Potash is intimately connected with the formation of starch and sugar within the plant, and crops that manu-

facture much starch and sugar—*e.g.*, potato and sugar-beet, &c., are usually responsive to potash. An apparent contradiction to this is the responsiveness of leguminous plants to potash, but in all probability much starch or sugar is manufactured and consumed in the symbiotic relationship between the plant and the bacteria in the root nodules. Most soils, except sand and peat, contain large reserves of potash, as it is one of the common elements of nature, but it is chiefly in a very unavailable form, and in ordinary agriculture what is available is used much quicker than the reserves become available.

Lime is nature's great acid neutraliser. There is a natural tendency for most soils to accumulate organic acids unless a neutralising agent is present, and co-incident with the development of acid is usually the development of an undesirable bacterial flora. Lime has also a good effect on the physical texture of most soils, but more especially clays.

LEA OATS.

It is self-evident that there can be no standard manuring for lea oats, as the conditions for this crop vary enormously. Each field must be considered on its merits. The extensive use of wild white clover appears to have introduced a new problem, and one very difficult to solve. Land which at one time would only grow an average length of straw if fairly liberally manured now grows crops that lodge and spoil without any manure. There is still plenty of land that requires liberal manuring to assure a decent crop, and there is every gradation between. On land rich in nitrogen, after wild white clover, most farmers are shy of manuring in any way. This is doubtful policy. The natural nitrogen in such soils appears to force a very luxuriant, and rather soft, vegetative growth, which means severe lodging and serious loss. A little manure to balance the excess of nitrogen could hardly make things worse, and might easily make them better. There are two principles in manuring that might be used with some effect :—

- (a) The fact that superphosphate tends to hasten maturity, make a strong crop throw its broad leaf early, and ripen early ; and
- (b) The fact that kainit has some effect in causing grain crops to stand.

Where a lea oat crop is certain to lodge, a dressing of $1\frac{1}{2}$ cwt. superphosphate and 2 cwt. (or more) kainit per acre might be tried.

Certain experiments appear to show that, for some peculiar

and unexplained reason, sulphate of ammonia, although it is an active nitrogenous manure, has an effect in preventing lodging.

On poor land the following is a very effective dressing :—

- 2 cwt. 30 per cent or 35 per cent superphosphate.
- 1 cwt. 58 per cent to 62 per cent mineral phosphate.
- 1 cwt. 30 per cent potash salts.
- 1 cwt. sulphate of ammonia.

This dressing may look heavy, but at current prices the cost is about 25s. per acre, and as the cost of labour, seed, and rent is nearly the same for a small crop or a big crop, it is never economic to attempt to save a few shillings per acre on manures. On average land, likely to throw an average crop, a dressing of mineral phosphate or basic slag, or these along with kainit, is certain to increase both the bulk and the yield. Such dressings (without ammonia) are never expensive. On some soils about 4 cwt. kainit alone proves an effective manure for lea oats.

SWEDES AND TURNIPS.

This is a very important crop in Dumfries and Galloway, and the area under mangolds, kale, and potatoes is relatively very small. Only on a few farms in any district is the rotation closer than six years, and longer rotations are found everywhere. Notwithstanding a fairly long rotation, finger-and-toe is rather prevalent, and in some seasons dry-rot is almost equally bad. The prevalence of finger-and-toe on dairy farms in Kirkcudbrightshire was largely responsible for the introduction of basic slag as a turnip manure about thirty years ago. The extensive use of bones in the past has already been referred to, and perhaps the first important break in the old system was the use of basic slag. Up till about that time fairly heavy dressings of dung applied in the drill was the almost universal practice, the bones and other manures being sown on the top of the dung and the drills split back. It was an expensive but effective system.

About that time, too, the earlier lecturers and technical advisers sent out by the West of Scotland Agricultural College were making their first efforts to gain the ear of the practical farmer, and were disseminating new ideas, the result of experimental work carried out at Kilnarnock and other experimental centres. Probably no district in Britain received these new ideas with less prejudice and an opener mind, or adopted them more readily, either in whole or in part. To grow roots with artificial manures only became a common practice ;

and the use of dung in the drills became less universal. To lighten labour in the spring, quite a lot of turnip land was dunged on the stubble, or dunged on the ploughed land.

At the present time the areas of land for turnips dunged in the drill, dunged on the stubble, and undunged must be fairly equal, with a much smaller area dunged on the ploughed land, but the practice of manuring with artificials only appears to be slowly but surely extending.

What is the composition of a well-balanced turnip manure? That is a natural question for the inquiring farmer. The turnip crop does not remove a great amount of phosphatic matter from the soil, but for some reason a turnip manure must be rich in phosphates. A mixture containing a total of about $13\frac{1}{2}$ per cent phosphoric acid (=30 per cent phosphates) ($\frac{1}{2}$ soluble), 4 per cent potash, and $3\frac{1}{2}$ per cent nitrogen is probably very near the ideal. An equally natural question is: How much of such a manure should be applied per acre? The answer to this second question will depend on the inherent fertility of the soil to be manured, but from 8 to 10 cwt. with dung, and from 10 to 12 cwt. without dung, may be taken as a fair answer, and quantities something like these are used by the most successful farmers.

Bones is still the favourite phosphatic manure with many farmers, especially the older generation, who still like to incorporate bone meal or bone flour in their mixtures, but for years the price of bones has been out of proportion to their value. Mineral phosphate of fine grist is now extensively used, and has proved very effective. It has the merit of being the cheapest of all manures. Some farmers are still a little suspicious of its lasting properties compared with bones, but as a source of permanent fertility it probably has no equal: it certainly has no equal at current prices.

The war brought a change in the process of manufacturing basic slag, and for about ten years much of the slag (fluor-spar slag) was of inferior quality, and the price had soared, with the result that slag fell into disrepute and much less was used. A more recent change in the method of manufacturing has given it back its original quality, and competition has forced down the price, so that basic slag is again one of the cheapest and most effective manures.

The south-west is very well catered for by manure merchants, and a marked change has taken place in the trade in recent years. Very large quantities of raw manures like mineral phosphate, phosphatic guano, basic slag, and kainit are now sold and used as such, while the use of compound fertilisers has diminished in proportion. Most merchants are now prepared to mix to the farmer's own formula, and as the facilities for mixing are very poor on many farms, and the farmer's time limited, this is a great advantage.

The following are two examples of well-balanced turnip mixtures :—

- 3 cwt. 30 per cent superphosphate.
- 4 cwt. 60 per cent mineral phosphate.
- 1½ cwt. 30 per cent potash salts.
- 1½ cwt. sulphate of ammonia.

The composition of the mixture will be very nearly 4 per cent soluble phosphoric acid, 11 per cent insoluble phosphoric acid, 4½ per cent potash, and 3·1 per cent nitrogen. On heavy land or on acid land the following mixture may be used with confidence, only in this case it is advisable to sow the slag by itself, and harrow it over before the others are sown.

- 9 cwt. 30 per cent basic slag.
- 2 cwt. 30 per cent superphosphate.
- 1½ cwt. 30 per cent potash salts.
- 1½ cwt. sulphate of ammonia.

In this case the total manurial ingredients are almost the same as the last, although the percentage composition is different.

POTATOES.

The area under potatoes is never large. The largest growers are found in the districts around Dumfries, Annan, Lockerbie and Kirkbean, but even in these districts a farmer who grows from 15 to 20 acres is reckoned a large grower. In Wigtownshire there is always a small area of earlies for the very early market. On the great majority of farms in the three counties, however, the area under potatoes is restricted to local requirements, and the manuring of these is not a serious problem. In all probability the bulk of these is grown with a good dressing of dung, supplemented with from 8 to 10 cwt. of a compound potato manure, or a turnip manure slightly enriched with potash and ammonia.

In the Dumfries, Annan, Lockerbie and Kirkbean districts, however, conditions are different. Here there is a well-established seed trade into England for both early and main-crop varieties. The trade in "ware" is of minor importance. The aim of the growers, consequently, is not so much a large total yield as a large yield of tubers of "seed" size. This fact influences both their method of planting and system of manuring. It is possible to secure a good yield per acre with a relatively small proportion of large tubers. The endeavour should be to replace every large tuber with two or three of medium size. To keep down the proportion of large "ware,"

without materially reducing the total yield, one or other of the following methods should be adopted:—

1. If whole seed is planted, plant it close.
2. If cut seed is planted, plant still closer.
3. In a good growing season cut the shaws before the tubers become too large.

The practical possibilities of these suggestions cannot be over-emphasised where tubers of "seed" size is the chief desideratum.

It was largely due to the energetic pioneer work done by Mr A. W. MacAlister, Dumfries, that the modern system of inspection of growing crops for purity of stock was established, and the district ranks high as a source of pure stocks. For at least twenty-five years before inspection was officially established, Mr MacAlister made a point of inspecting for purity all growing crops the seed from which he was likely to be purchasing.

It is well recognised in the district that a potato manure should be rich in potash and nitrogen, and the usual custom is to give a good dressing of dung, either in the drill or partly on the stubble and partly in the drill, and about 10 cwt. per acre of artificial manures. A good manure mixture for potatoes has its own characteristics. It should contain a relatively high proportion of soluble phosphate as well as potash and nitrogen. The ideal balance is perhaps about $5\frac{1}{2}$ per cent soluble phosphoric acid, $5\frac{1}{2}$ per cent insoluble phosphoric acid, 9 per cent potash, and 5 per cent nitrogen.

The following mixture represents the type of manure it is advisable to use per acre, although many growers do not yet use a mixture so concentrated in potash and ammonia.

- 4 cwt. 30 per cent superphosphate.
- 2 cwt. 60 per cent mineral phosphate.
- 2 cwt. 48 per cent sulphate of potash.
- 2 cwt. sulphate of ammonia.

During last season many crops were lifted giving a total yield round about 12 tons per acre, but, as already mentioned, that is not exactly the grower's aim. A yield of 8 or 9 tons per acre of tubers of "seed" size would probably please him better.

MANGOLDS, KALE, AND CABBAGE.

The area of any, or all, of these crops grown on any farm is very small, and specialised manuring is not seriously considered. A heavy dressing of dung, with about 8 cwt. per acre of a turnip or potato mixture and 1 cwt. nitrate of soda top-dressed on the crop after it is growing actively, probably satisfies the average farmer. All these crops respond to potash,

and all are greedy for nitrogen. The ideal mixture is about $5\frac{1}{2}$ per cent soluble phosphoric acid, $5\frac{1}{2}$ per cent insoluble phosphoric acid, 6 per cent potash, and 7 per cent nitrogen. A good potato manure meets their requirements fairly well, only the potash should be kainit or potash salts instead of sulphate of potash, and a good proportion of the nitrogen should be in the form of nitrate of soda.

REDLAND OATS.

To what extent redland oats require to be manured depends on the natural fertility of the soil, the previous manuring, and whether the root crop was eaten on the land. Generally speaking, the land is under hay and grass during half the rotation or longer, and, as things are at present, pasture is the most valuable crop grown. On a few farms, especially in the Kirkcudbright district, some fields are sown out without a covering crop, but the practice is not widely followed. The danger of the oat crop lodging deters many farmers from applying any manure, but others take the risk and manure this crop regularly. Quite a number still pin their faith on bone meal and apply a few cwt. per acre, but an ever-increasing number are using mineral phosphate, or potassic mineral phosphate, 6 cwt. per acre being a common dressing. Some progressive farmers prefer basic slag, and apply from 7 to 10 cwt. per acre. Unless the land is very light and inclined to be gravelly there is no better manure than slag for this crop, as it increases the yield, improves the quality of the grain, and has a marked effect in assisting the grass seeds to establish themselves.

Compound fertilisers, or complete manure mixtures, are seldom used on redland oats, unless on land that is certain to throw a short weak straw. If the previous crop of turnips has been eaten on the land by sheep there is less need for manure, but even then a phosphatic manure has little effect in causing lodging, and certainly has a beneficial effect on the "seeds" and future pasture. On many farms both the oats and the "seeds" are benefited by kainit or potash salts, and for that reason potassic mineral phosphate and potassic slag are becoming increasingly popular. In any case the first objective is to secure and establish a good catch of "seeds," and the second is to secure as good an oat crop as is consistent with the first. It is impossible to secure good "seeds" followed by a lasting pasture on land deficient in phosphates and lime. Following potatoes the straw is usually short, and remarkably few farmers appear to realise that the cause is likely to be a deficiency of nitrogen. An oat crop following potatoes should nearly always get extra nitrogen.

WHEAT, BARLEY, AND RYE.

So very little of these three crops is grown in the south-west counties that they need hardly be considered in the present review.

“SEEDS” AND HAY.

If the redland oats were not manured it is a common practice to manure the “seeds” in the autumn in the way suggested for the oats, then apply an active nitrogenous manure in April. It is an equally common practice to dung “seeds” and also meadow land in the autumn or early winter. If “seeds” or other land intended for hay is grazed, as it often is, well into the spring the matter is entirely different. Probably not more than one-third of the land intended for hay can be hained during the winter and spring. The needs of ewes and lambs are usually too insistent. Hay which has not been hained has the shortest growing period of all crops, and its chief growing period, moreover, is in the relatively cold months of May and June. Slag and mineral phosphate, or these along with kainit or potash salts, if applied in the autumn or early winter and followed by a dressing of a nitrogenous manure about the beginning of April, is a sound way of manuring hay; but if the manuring has to be delayed until the stock is removed about the beginning of May, or later, then an active forcing manure must be used.

Superphosphate is the only phosphatic manure active enough. A mixture like the following is usually relied upon to bring on a good crop :—

- 3 cwt. 30 per cent superphosphate.
- 2 cwt. 14 per cent kainit.
- 1 cwt. of one of the nitrogenous manures.

There is now a wide choice of quick-acting nitrogenous manures, all alike reliable :—

- Sulphate of ammonia.
- Nitrate of soda.
- Nitrate of lime.
- Nitro chalk.
- Calcium cyanamide.

Probably nitrate of lime is the best for hay, but its deliquescent nature makes it nasty to work with, and for that reason it is never likely to be a favourite. Calcium cyanimide, with its high proportion of unslaked lime, is very effective and reliable. It has a tendency to brown the herbage

a little at first, but the recovery is rapid, and on land deficient in lime it probably has no equal. It should not be mixed with superphosphate. Nitro chalk has been well tried out on pasture land, and is also a very active manure for hay. It is now more extensively used than either of those already mentioned. Sulphate of ammonia and nitrate of soda are too well known to require comment.

PASTURE.

Not so many years ago rotation pastures were seldom manured, although the manuring of poor permanent pastures with slag and other manures has been practised for many years. To-day the manuring of rotation pasture, as well as permanent pasture, is widely practised. I do not refer to the new system of intensive grass management which is being watched with great interest by many progressive farmers, but to ordinary manuring with insoluble phosphate, mainly basic slag and mineral phosphate, or these along with kainit or potash salts. Occasionally superphosphate or potassic superphosphate is applied. The slower-acting phosphates are usually applied during the winter or in the early spring. The standard dressing of basic slag is from 8 to 10 cwt. per acre, with the potash extra if potash is applied; and the standard dressing of mineral phosphate about 6 cwt. per acre, with the potash extra. The value of good pasture at the present time justifies the expense, and there have been few more important modifications of agricultural practice in recent years.

Intensive manuring of grassland, in the very modern sense of the term, is not easy to put into practice on the ordinary farm, but the dairy and stock farmers are keenly interested in this development, and during the last two seasons quite a number have applied one, or perhaps two, dressings of a quick-acting nitrogenous manure to a field, or fields, with a view to securing good pasture two or three weeks earlier than the normal. So far as can be judged from the very limited experience of this innovation, it is likely to prove successful, and there is every indication that the practice will become common. In Dumfries and Galloway the last week in March is perhaps early enough for the first application. The favourite manure so far has been nitro chalk, but a few have tried the very quick-acting and effective nitrate of lime. Sulphate of ammonia and nitrate of soda appear almost equally good. Calcium cyanamide has been less used than any of the others mentioned, but when it has been used it has been very effective. Almost invariably its first effect is to brown the pasture slightly, but the recovery is rapid and the result excellent.

It contains a good proportion of unslaked lime, which has an added value on most soils. In all probability this will become one of the most effective and most extensively used manures for this particular purpose. It would almost appear as if calcium cyanamide had a bactericidal and fungicidal effect which gives it an added value.

The success, or failure, of the practice of using quick-acting nitrogen on pastures in the spring will depend very largely on how the comparatively light soils of the south-west can stand up to this treatment for some years in succession. It is a well-established fact that these soils deteriorate quickly under too constant dressings of sulphate of ammonia or nitrate of soda in the ordinary course of farming, and that every precaution must be taken to keep up their lime and phosphate content. The treatment of *poor* soils with lime, phosphates, and potash, followed by nitrogen, is quite likely to end in failure, because such land does not become truly fertile in one season. It requires time as well as treatment. Only land which has been well farmed for years, and has within itself a good reserve of inherent fertility, is likely to stand the strain of intensive grass farming, no matter how liberally basal manures may be used.

LIME.

The liming of land is usually considered a capital outlay, which has to be faced at intervals, but which is quite independent of the annual applications of manures. Good crops of potatoes and fair crops of oats can be grown on land deficient in lime, but such land is usually not "fertile" land in the true sense of the word. One of the best indications of true fertility is the progressive improvement of rotation pasture, so that it is at its best when ready to be ploughed down again. Galloway contains no limestone, and only in a few districts of Dumfriesshire are there outcrops of limestone rock. At the present time there is not a lime-kiln, or a limestone grinding plant, working in the three south-west counties.

The soil, in districts where lime is not readily available, is liable to become very deficient in this important fertilising agent, and by the end of the war the need for applications of lime had become very marked on most farms in every district. More than twenty years ago the first small quantities of ground limestone, shipped from Carnlough, near Larne, were used in Galloway, but the practice of using ground limestone made little progress until the grinding plant was installed at Flusco, Cumberland, some years later. Ground limestone is now used fairly extensively. It has the merit of being easy to transport, easy to handle, stores well, and admits of

a very even distribution. It is quite effective on most soils, and its use is now well established. It is difficult to estimate the relative amounts of burnt, or shell, lime and limestone used in the last three or four years. It is sufficient to say that the years since the war have seen a great increase in the use of lime in one form or another. Incidentally it may be remarked that the improvement noticeable since wild white clover came into general use is probably not altogether due to the fertilising value of that plant, but is to some extent due to a more extensive use of lime and limestone, phosphatic manures like slag and mineral phosphate, &c., and potash. In other words, the average standard of fertility has been raised quite independent of wild white clover, nevertheless no one would wish to minimise the value of that plant to the agriculturist.

In an article like this the manurial requirements of separate farms, or even different districts, cannot be treated in detail. In the nature of things this review must be of a general character. The principal factors that determine the manurial requirements of the area as a whole are :—

1. Its great tracts of relatively light stony soil ;
2. Its somewhat moist and rather sunless climate ; and
3. What may be called (for want of a better term) its three-crop rotation—oats, green crop, oats, followed by as many years of pasture as circumstances will allow.

A very simple rotation, but one eminently suited to the peculiarities of the area.

AGRICULTURAL RESEARCH IN SCOTLAND IN 1929.

BEING A BRIEF SUMMARY OF WORK AT THE
SCOTTISH AGRICULTURAL RESEARCH
STATIONS DURING THE YEAR.

*Readers desiring fuller information on any of the subjects mentioned
should write to the Secretary of the Station at which the investigation
is being carried out.*

ANIMAL BREEDING RESEARCH DEPARTMENT.

UNIVERSITY OF EDINBURGH, WEST MAINS ROAD.

THE year under review has been one of growth as regards material things. In March 1930 the new building for offices and laboratories which was designed by Sir Robert Lorimer was sufficiently well advanced to enable the work to be transferred from the Chemistry building where the Department had been situated for the past five years. To show the growth in the staff and in the development of the scientific work of the Department attention may be drawn to the fact that, while the new building provides about five times the previous accommodation, on the transference of our activities to it practically all the available space has been immediately occupied. A new intensive poultry house has been erected and was in full working order during the greater part of the year under review.

In November, intimation was made to the University Court of a series of gifts from Mr T. B. Macaulay of the Sun Life Assurance Company, Montreal. Mr Macaulay was interested particularly in the developments taking place at the Department which were being directed by Professor Crew and Dr Wiesner. These inquiries are concerned with the parts played by the various endocrine organs in the different phases of reproduction; if further results continue to be as promising as the earlier ones they should have very considerable bearing upon the practice of human medicine. Some of these results, such as the diagnosis of pregnancy by a simple urine test and

the effect of certain hormones upon the growth of the body, are likely, also, to have repercussions on agricultural practice, and preliminary experiments are already being conducted along these lines. To further this work Mr Macaulay has founded and endowed a University Lectureship and made various grants of money amounting to over £20,000.

In addition to these munificent gifts Mr Macaulay, recognising the need for a better application of results obtained in the Department as regards agricultural practice, has made a further donation of £5000 for the purchase of a farm to which it is hoped entry will be obtained next Martinmas.

While material growth has been taking place the scientific work has not been neglected, and the following is a *résumé* of some of the results which have been obtained during the year and which have particular bearing on agricultural affairs.

POULTRY.

By implanting male reproductive organs into females there was an assumption of male feathering until the first moult when the male feathers were replaced by normal female plumage. The combs were also affected. From this investigation is drawn the conclusion that there is a specific substance essential for the proper development and functioning of the reproductive glands. When the reproductive tissue of both sexes is present the functioning of one of the sex glands leaves an insufficiency for the other. Investigations relating to the thymus gland show that the mature male possesses one which is more than twice the size of that of the mature female. Implantation of the ovary in the male reduces the size of this gland till it appears like that of the normal female. Some work has been done on the plumage colour in the turkey, and various crosses have been raised, but blackhead is causing trouble. Other inquiries relating to the inheritance of colour in poultry and ducks have been made.

CATTLE.

A study has been made of the part inbreeding has played in the construction of the modern Shorthorn, especially as regards the prize-winners of the Scotch or Beef type, and the part that various sires have played in the creation of the present-day type of animal. It was found that the prize-winners are slightly more inbred than the average of the breed, though not significantly so. More interesting results were obtained when the individual pedigrees and types of mating were studied. These clearly showed that certain

immediate ancestors were more likely to beget prize-winners than others.

A similar study has been made of Jersey cattle. The amount of inbreeding in the construction of this breed has been comparatively small. A study of the pedigrees of the high yielders revealed the fact that these were significantly less inbred than the average of the breed.

Inheritance of Milk Yield and Quality.—From the above facts, as well as from other data, the deduction was made that certain of the factors governing the inheritance of total yield as well as quality of milk were not inherited in the common autosomal manner, but appeared to be inherited in a sex-linked manner. Evidence from workers in America supported this belief. Further studies of a statistical nature were accordingly undertaken, and are still in progress. The material for these studies consists of pedigree Ayrshire cows recorded in the Annual Report of the Scottish Milk Records Association. The results so far obtained confirm the impression that some of the factors governing milk inheritance are sex-linked. This statement cannot be accepted as proved until further data are available, and work is progressing along these lines. Much assistance in these studies has been obtained from Dr R. A. Fisher, F.R.S., of Rothamsted, and also from Mr M'Candlish of the West of Scotland College of Agriculture.

Average Age of Sires and Dams.—A study of the average age of sires and dams in six pedigree breeds is nearing completion. The average age of bulls in the beef breeds is 4.06 years \pm .04, while the average age of cows is 6.02 \pm .05. For the dairy breeds the average age of the bulls is 3.69 \pm .03, and of the cows, 5.49 \pm .05.

Contagious Abortion.—Work was done upon immunological reaction connected with Contagious Abortion to see whether the results could be brought into line with the previous work dealing with syphilitic reactions. It was found that considerable similarity exists. A systematic survey of reagents has been carried out to ascertain their effect upon the life of spermatozoa. The addition of acid, alkali, or salt to the water enables the spermatozoa to exist for some considerable period if the concentrations are of a nature which prevent tissue injury.

FIGS.

This work has been greatly helped by a Committee which has been appointed to assist in the pig work of the Department and to advise the Animal Breeding Committee on the conduct of the work. It consists of practical pig breeders and bacon curers.

Pig-Testing.—The Pig-Testing Scheme, which was started in

the late summer of 1928, has made such progress that during the whole year under review practically all the pig accommodation at the Department has had to be devoted to this purpose. During the first six months of the testing operations the information obtained from the tests was used as a criterion by which the final points concerning the scheme were determined, more especially those concerning the basis on which the awards were to be made. With the year's experience the scheme is now fully organised, and is approaching the stage when it can be run along routine lines. It is proposed to publish the first report of the Testing Station in a short time.

SHEEP.

A programme of work has been arranged under two main headings:—

1. A study of the physiology of wool growth carried out exclusively at the Department.
2. Work of an extended practical nature where the material studied was flocks of sheep throughout the country.

1. *Physiology of Wool Growth*—Much of the work under this heading has necessarily been of a preliminary nature. It was soon realised that in Scotland fleece problems were of a specific nature. The majority of the sheep population consist of Blackfaces, a sheep with fleece characteristics peculiar to itself. For this reason many of the results already obtained by other research workers are not applicable to the case of the typical Scots sheep.

A preliminary examination of the fleece has been made upon animals kept in the Department, and the periodicity of the growth of kemp and wool in the fleece has been established. It has been shown that, irrespective of clipping, the kemp has a growth-time roughly from February–March till October–November and that in the intervening period it remains in the fleece as a dead fibre only. Wool, on the other hand, shows a period of most active growth from July till March. During the early summer months a large number of these wool fibres are shed from the follicles, and unless the fleece is clipped these fibres form a dense pelted mass well known to flock-owners as the 'rise.' When in excess or when clipping has been delayed, this 'rise' becomes pressed outward from the skin surface by the growth of the remaining fibres, and forms the 'cot' of the fleece, which is so detrimental from the manufacturer's point of view. The results so far obtained are by no means conclusive, and the study is being continued.

Further investigations are being carried out with a view to

determining the rôle the thyroid gland plays in the production of wool. This work must of necessity proceed slowly, and up to the present the results are inconclusive. It appears, however, that the thyroid is one of an important chain of endocrine glands which directly influences the character of the fleece.

An examination of the rejuvenation and other theories of Voronoff is being continued. He claims that the implantation of a gonad graft from an active mature ram into an aged ram will confer upon the latter certain characteristics of the former, resulting in a return to full reproductive activity. He claims further, that grafting an immature male with a graft from a mature male will result in an increase in growth rate and quantity of wool produced. Up to the present, while there are indications that a temporary stimulus does follow the implantation of a graft, it appears that this is quickly neutralised by a subsequent slowing down of activity. This work must be continued for some time before the results obtained can be looked upon as final.

2. *Applied Work.*—A large number of leading sheep-breeders in Scotland have agreed to collaborate with the Department in an endeavour to determine the nature of the inheritance of kemp and black-spotting in the fleece. A method of analysis for kemp, &c., applicable to the Blackface fleece, and the assessment of a figure value, have been undertaken. Preliminary work was necessary to establish as nearly as possible an average value by count and weight for each of the three main classes of fleece fibres, wool, heterotype fibre, and kemp. The proportions of these in a given fleece are determined, and a value is put upon each according to their divergence from the mean. It is expected that the results of the investigation will show whether elimination of kemp from the fleece without prejudicing its other qualities is a possibility or not. Concurrently with this the influence of face colour and black-spotting in the ram upon his progeny is being examined, but it is still too soon to draw any definite conclusions from the available data. It is hoped, however, that this examination, when it has been completed, will afford much information of a very valuable nature.

RABBITS.

An interesting study on the wool production of Angora rabbits leads to conclusions relating to the influence of various factors which, it was thought, might affect wool growth and wool yield. It was found that age does not appear to affect the annual wool production of bucks up to three years. In the does an increase in the weight of the wool was noted in the third year, but this may have been due to fibre coarsening. It was found that small rabbits produce a greater weight of

wool per ounce of live weight than do larger individuals, and therefore there is no correlation between live weight and wool yield. On extending this study to include the effect of season, it was found that this exercised a profound influence, the heaviest production taking place in the months September to January inclusive, and the lowest from March to July. An interesting correlation between the presence of 'furnishings' and high yield was observed, it being found that individuals with pronounced ear tufts were the best yielders.

It is found that duration of pregnancy is affected by season, breed age, and litter size. It is most prolonged in May and shortest in November, the variation moving in a smooth curve between these two months. Breed also produces a significant effect upon the length of pregnancy, and large litters are carried longer than are small litters. The age of the doe has some effect, the duration of pregnancy being slightly decreased between the first and second litters, and thereafter lengthened.

IMPERIAL BUREAU OF ANIMAL GENETICS.

In accordance with the agreement made with the Imperial Agricultural Bureau, the Imperial Bureau of Animal Genetics was attached to the Department and started in April 1929. It has already compiled complete lists of all research done on the genetics of the pig and the horse, and in a short time monographs of these two animals will be issued. Considerable work has been done relating to experiments which have been conducted in various tropical parts of the British Empire, and it has served a useful purpose in the co-ordinating work which is being done in various parts of the Empire.

THE ROWETT RESEARCH INSTITUTE.

BUCKSBURN, ABERDEEN.

This Institute has now been organised into three semi-independent divisions—viz., The Rowett Research Institute, the Duthie Experimental Stock Farm, and the Reid Library with the Imperial Bureau. Though the work of these is correlated through one central administration, each has its own sphere of work, its own staff, and separate funds.

THE ROWETT RESEARCH INSTITUTE.

The work of the Institute is confined to fundamental research in nutrition. The following are at the present time

the three main lines of investigation. Systematic work on these is being continued over a series of years. Probably the most important is the influence of diet on susceptibility to disease. It is unnecessary to refer further to this as the present volume contains a paper on the subject. Another main line of research is the rôle in nutrition of elements such as copper, aluminium, and manganese, which are present in foodstuffs in relatively small quantities. Recent work has shown that some of them are essential to health. Thus, for example, it has been found that minute traces of copper have an extraordinary effect in curing or preventing certain types of anæmia. Problems of digestion—*e.g.*, the movements of the intestine in ruminants and the absorption of nutrients from the alimentary tract, form the third chief subject of study.

With regard to the other work, probably that of most general interest is the continuation of the investigation referred to in last year's report on the food value of milk. A survey of diets in cities in Scotland shows that the diets of something like 50 per cent of the families examined are inadequate in certain respects, and could be greatly improved by an increased consumption of milk and green vegetables. This confirms the findings of the milk test which showed that increased consumption of milk was accompanied by an increased rate of growth in children of from 20 to 40 per cent. It has been shown in the course of this work that there is a seasonal variation in the rate of growth of children. Growth is twice as rapid in April, May, and June as it is in October, November, and December. Observations are being made on young cattle to ascertain whether they show a similar seasonal variation in the rate of growth.

DUTHIE EXPERIMENTAL STOCK FARM.

This Farm is now established. It extends to roughly 1000 acres, of which about 560 are arable or pasture and the remainder rough hill grazing. It is divided into dairy, beef cattle, sheep, pig, and poultry departments. Each of these is run as an economic unit, and an attempt is being made to run the farm on a self-supporting basis financially. It is believed that this will make the work of more immediate practical value.

Probably the most important work for the first two or three years is the collection of data on rate of growth, production, and on food consumption of animals under good ordinary practical conditions, and on rations composed of ordinary foodstuffs balanced in accordance with already existing information. This will give a normal standard which can be

attained in ordinary farming and surpassed by specially expert stock farmers. This standard will serve as a basis of comparison in subsequent attempts to apply the results of scientific research to the industry.

In addition to this collection of normal data a number of practical experiments, of which the following are examples, have been done. By request, tests were done with cattle and pigs to demonstrate that oats and potatoes can be used in large quantities to replace other foodstuffs. The influence of the bulk of the ration on the yield of dairy cows is being tested by feeding varying amounts of turnips, silage, and hay to different groups of animals, the amount of concentrates being increased as the amount of bulky food was decreased, so that the total dry matter and feeding value were maintained constant. So far, the results seem to indicate that decreasing the bulky part of the ration below a level represented by 40-50 lb. of turnips, and giving the difference as concentrates, has an adverse effect on the yield. These experiments, however, cannot be regarded as conclusive. They will be repeated next winter. In sheep the influence of various foodstuffs on the rate of growth and quality of wool is being investigated. It is being found that the wool is definitely affected by the state of nutrition of the sheep, which in turn can be influenced by certain food constituents. In poultry the changes which occur in the blood, bones, and ductless glands of the fowl in growth, onset of laying, and moulting is being studied. It appears that prior to the onset of laying there is an increase in the amount of calcium in the blood and this is associated with changes in some of the ductless glands. It is hoped that this physiological study of the fowl may throw some light on the factors which determine moulting and also on the reason for the rapid decrease in egg yield in domestic fowls from the first year onwards.

REID LIBRARY AND IMPERIAL BUREAU.

The Bureau was established in the Reid Library during the past year. An index showing the more important researches in animal nutrition throughout the Empire is being compiled. It is being found that there is a number of workers throughout the Empire studying similar problems, and it is hoped that the Bureau will facilitate the rapid exchange of information and ideas. It is of interest to note that workers in widely separated parts of the Empire are willingly co-operating in the exchange of information, and in other ways doing their utmost to make the Imperial Bureau a success.

THE SCOTTISH PLANT-BREEDING STATION.

CRAIGS HOUSE, CORSTORPHINE, MIDLOTHIAN.

In the report in the previous volume of the 'Transactions' regarding the work at the Scottish Plant-Breeding Station, reference was made to the work with herbage plants. On this occasion an outline will be given concerning the breeding work with swedes.

The problems that are being investigated were selected mainly for the purpose of obtaining information which would lead to improved methods of breeding being devised. Before these problems can be solved, several generations of plants must be examined, and the type of plants in each generation compared. The swede is a biennial plant, and this characteristic renders progress in analysing the hereditary characters slower than it generally is in annual plants, such as cereals. At the beginning of the investigations it was found that in most of the varieties grown in ordinary practice, roots of different shapes and colours were present. A brief account of the results of trials with various samples of the 'Best-of-All' variety, which is a Purple-top type, may illustrate this. Several samples of the 'Best-of-All' variety obtained from various growers, and five varieties of different names but believed to be very similar to the 'Best-of-All,' were sown in comparatively large strip-plots. Botanical observations were made on the plants throughout the season, and it was found that Bronze-top roots occurred in every 'Best-of-All' strain, the proportion in the different strains varying from 1 to 5 per cent. The roots also varied or fluctuated considerably in shape, and, when grouped according to shape, strains contained different proportions of shape-types. In order to discover whether these apparently different types were hereditary variations or merely modifications, roots of different shapes and colours were selected for seeding. Each plant when in flower was protected from cross-pollination for the purpose of obtaining self-fertilised seed. The seed thus obtained was sown in plots, and it was found that the progenies bred true for several shades of colour exhibited by the parents, including the Bronze-tops mentioned above, and in some cases for root shape also, but in other cases they showed a range of shapes. In one instance a Purple-top root gave rise to a progeny consisting of 75 per cent Purple-top roots and 25 per cent Bronze-top roots. These results indicate that both hereditary and environmental factors are in operation.

In addition to studying the heredity of shape and colour of the roots, the mode of inheritance of various other characters, such as 'splitting,' strongly 'fanged roots,' dry-matter, and sugar content, resistance to Finger-and-Toe disease, and tendency to 'bolt' or run to seed, is being investigated. Observations have also been made with a view to discovering the heredity of the type known as a 'bulbless bolter,' an aberrant type of plant that occasionally appears in crops of swedes.

The effects of self-fertilisation are being critically examined, and it has been found that many of the selfed strains compare favourably with their commercial parent varieties, on account of the elimination of certain characters, and the fixation of others, while lack of vigour is not noticeable and seed production is usually good. The wide range of bulb size, which is chiefly due to soil and weather conditions, persists in the pedigree lines when these are grown under ordinary cultural conditions. A slight increase in size of bulb is believed to occur in the generation immediately following a cross, but this is a temporary effect, which could be employed, if desirable, in the multiplication stage of a stock composed of two or more similar pedigree lines.

Selection and self-fertilisation of plants has proceeded for four generations. Each year a few pedigree strains are tested in small yield trials, while others are multiplied for trial on a larger scale. These strains are compared with the commercial varieties from which they originated, and determinations of yield and root weight, and in some cases dry matter and sugar yields, are made. Results indicate that some of the strains may prove superior to their commercial controls, and these are being further bred and tested, since it is necessary to observe their behaviour over a number of seasons.

An extended investigation into the relation between the composition of swedes and their nutritive value has been carried out by a Committee appointed by the Board of Agriculture for Scotland (see 'Scottish Journal of Agriculture,' volume ix., 1926, page 160; volume x., 1927, page 428). As a result of these investigations it appears probable that the constituents of most importance are the Dry-Matter or the Soluble Solids present in the root. The Committee has worked out methods for the determination of these constituents, and the methods are now being tested at the Plant-Breeding Station as a means of selecting parent roots.

WEST OF SCOTLAND AGRICULTURAL COLLEGE.

(a) MILK PRODUCTION DEPARTMENT.

The feeding and management of dairy cattle present a wide variety of problems requiring investigation. Some of these are being studied by this Department with a view to determining their influence on the economy of milk production. Only a few of the problems on hand can be mentioned here.

The Root Supply.—As the result of work over several years, it is now evident that root crops have a place in the dairy ration on the majority of farms in Scotland. Rations without roots, as well as rations containing up to 60 lb. per head daily of swedes, have been used, and in all cases so far it has been found that 10 lb. of swedes is equivalent to 1 lb. of a good concentrate mixture. At present an allowance of 80 lb. of swedes is being used; and though it is too early to make any prediction, the results to date are quite satisfactory.

Where a good concentrate mixture can be made up for £8 per ton swedes are worth 16s. per ton, with the mixture worth £9 the swedes are worth 18s., and so on. The production of root crops for dairy cattle on the lighter soils suited to the purpose can therefore be definitely recommended as an economical proposition. On the heavy soils silage or beet pulp must be used, or the cows fed without a succulent feed.

Protein Concentrates.—One of the main problems of the dairy farmer in Scotland is the provision of a supply of protein for his cows. Where beans can be produced, the difficulty can be met to a considerable extent with home-grown material. However, on the lighter land this is impossible, and so purchased feeds must be used to meet the needs of the cow. This Department is investigating various feeds with a view to finding the most suitable for use with home-grown grains, such as oats and barley.

In this connection two definite problems arise. A mixture of protein feeds will usually be best for the dairy farmer with a large herd, as he can purchase in relatively large quantities. The owner of a small herd has greater difficulty, however, as he purchases only in small quantities. In his case a fair amount of one suitable feed, if it could be obtained, would be more economical than small quantities of several.

In the meantime it must be recognised that if only one feed is to be used, there is perhaps nothing better for production than bean meal, though it is generally too high-priced for liberal use. One of the safest high protein feeds for use in

mixture with oats is decorticated earthenut cake, though it must be remembered that it contains twice as much protein as bean meal, and so a smaller quantity will suffice.

Milking Machines.—As a result of the milking machine trials which have been completed, it has been found that when properly worked the milking machine gives good results. The two main factors in determining whether or not a milking machine should be installed are the size of the herd and the cost of labour. Where labour is high a milking machine may be installed for a herd of forty cows, but where labour is cheap the herd must contain at least sixty cows before the installation of a machine can be justified economically.

Age and Lactation.—It is held by some that it is the age of the cow, rather than the number of calves she has produced, which influences her yield, while others maintain that there is a correlation between the number of the lactation and production, rather than between age and production. From an investigation of the records of the Scottish Milk Records Association it has been found that, when making a correction in yield for the relative maturity of the cow, either the age of the cow or the number of the lactation can be used quite satisfactorily.

Life of the Cow.—In view of the attention given at present to the length of life of the dairy cow, it may be of interest to note that from the records available it would appear that the average life of the dairy cow after she comes into the producing herd is around four years. It has been found that for animals with five or more lactations the older the heifer at the time of first calving, the longer is her life, but the shorter her period of usefulness.

(b) MILK UTILISATION DEPARTMENT.

The devastating cheese taint which caused such serious financial loss to the Scottish cheese industry in 1928-29 was further investigated. The causal factor, a putrefactive anaerobe whose action is encouraged by the associated growth of other organisms in affected cheeses, was more fully studied, and the path of infection clearly determined. There seems little doubt that impure liquid culture starters were the vectors of the contaminating organism. We have also demonstrated that by the use of authenticated pure culture starters the taint can be eliminated. Because of the havoc wrought to the cheese trade by this cheese taint, the National Farmers' Union made representations to the Department of Agriculture that some official action should be taken which would preclude a repetition of this costly defect in Scottish farm-made cheese.

The College anticipated any such action by the issue of guaranteed pure culture starters from the Department of Dairy Research. Since the inception of this service it is noteworthy that putrefaction in Scottish cheeses has practically been eliminated.

A study of the factors which are responsible for slow working in cheddar cheese-making was initiated during the past season. Slow working has been attributed either to bacterial antagonism, to the 'germicide action' of the milk, or to weakness in the starter. The latter cause is probably the least common of the operative factors. In New Zealand dairy factories, where slow working is the bane of the cheese-maker, an infection of the primary milk with *B. subtilis* is stated to be the cause of this arrested lactic acid fermentation, and some experimental evidence has been adduced to support this statement. We have endeavoured to verify this work, but after an extended trial with four different and authenticated strains of *B. subtilis* we have altogether failed to confirm this hypothesis. Indeed, we have found that *B. subtilis*, which is a common infection in cheese-milk, especially in the early part of the season when fodder cheese is made, has a slightly accelerating effect on the lactic acid fermentation. (Incidentally also we have found that *B. subtilis* has no detrimental effect on the flavour of cheese when clean milk is employed and a good active starter used. Neither does it induce discoloration.)

Slowness appears to be due to a specific factor of an antibacterial nature which is present in the primary milk, and which is concentrated in the cheese curd by the action of rennet. Efforts were made to overcome this annoying reaction in the cheese milk by the use of pure culture starters to which specific activators were added. (Such activators are stated by some continental investigators to be of special value in invigorating lactic acid cultures.) The results were entirely negative. Lemon juice and potato juice, the two activators reputed to be most potent, were found to have no accelerating action either on the starter or on the fermentation of the cheese milk even when added to the latter in substantial amounts. Addition of starter to the evening's milk in carefully controlled amounts, a modified temperature of ripening, and the pasteurisation of the primary milk are all helpful measures in overcoming slowness. The factors responsible for slowness are being further investigated, and an effort will be made to determine whether the reaction of the milk can be modified by specific treatment of the producing cows.

The effect of specific soil organisms which may occur as contaminations in cheese-milk was investigated. This line

of inquiry, which promises to yield useful results, is being further exploited.

Lack of 'blueing' in Stilton cheese and the attendant formation of a rough irregular coat was found to be associated with a species of actinomycete which gained access to the primary milk during the milking period.

Some work on the origin of 'rusty spot' infection of cheese under practical farm conditions was undertaken, and it is believed that an answer to this difficult question can now be given with some degree of assurance. The staining of Lancashire cheese alluded to in last year's report appears to be very closely allied to typical rusty spot infection to cheddar cheese and indeed to be merely a form of the latter.

Work on selected lactic ferments and the improvement of starter types was continued and amplified. Over 5000 pure culture starters have been issued from our laboratory during the past year, and their employment by the practical cheese-maker and butter-maker has been attended with satisfactory results. Comparative trials with single and dual cultures in cheese-making showed the important influence of associative bacterial growth on the general characteristics of the finished cheese. As a result of careful selection and combination, starters having not only the desirable virulence, but also the ability to produce good flavoured butter and cheese, have been evolved. These starters are of proved value practically. A combined starter which may be grown at the usual temperature and cultivated in the ordinary way and built up from selected strains of *Streptococcus lactis* and *Lactobacillus acidophilus* has yielded promising results as a cheese starter.

During the past year cultures of *L. acidophilus* of our own isolation have been extensively issued both to the industry and to private individuals. Favourable results from its use in human therapy and in the control of certain poultry diseases have been reported, and there appears to be a promising future for its more extended application. A systematic study of the bacteriological and biochemical characteristics of this organism has been made by us, the factors having a direct bearing on the preparation of acidophilus milk on a commercial basis have received special attention, and it is proposed to issue a short treatise on the subject which will embody the results of our investigations.

A study of the factors which influence the flavour of milk initiated last year is being continued.

NORTH OF SCOTLAND COLLEGE OF AGRICULTURE AND UNIVERSITY OF ABERDEEN.

SOILS AND DRAINAGE RESEARCH DEPARTMENT.

The Department has been passing through a transition stage and will be in future merged in the Macaulay Research Institute. This Institute is being founded in Aberdeen with the aid of a generous capital grant given by Mr T. B. Macaulay, President of the Sun Life Assurance Company of Canada, to carry out research on soils, and especially on peat and moorland soils. The Institute is to be an independent research institution under the direction of a governing body appointed by (1) the Department of Agriculture for Scotland, (2) the University of Aberdeen, and (3) the three Scottish Agricultural Colleges. Dr Ogg, who is at present Advisory Officer in Soil Chemistry in the Edinburgh and East of Scotland College of Agriculture, has been appointed the first Director of the Institute. This Institute is to be the National Research Institute for Soils in Scotland, and is to undertake research into soil problems and especially into problems bearing on the peat, heath, and moorland soils, which are so plentiful in Scotland. The problem of a soil survey for Scotland will also be taken over by this Institute.

As in the case of other agricultural research institutes in Scotland the annual maintenance funds for this Institute will be supplied mainly by the Department of Agriculture for Scotland, and by the Development Commission. Sir Robert Greig of the Department of Agriculture has for years advocated the foundation of a Soil Research Institute in Scotland, and it is largely owing to his influence and help that the generous interest which Mr Macaulay takes in the land of his ancestors was turned to the support of soil research. Steps are now being taken to get suitable buildings and land for the Institute in the neighbourhood of Aberdeen, and work will be started during the present year. Very useful work on soil fertility problems can be done by means of pot experiments, and most soil research institutions include a Pot Experiment Station. It is intended that the Pot Experiment Station of the new Institute will be got ready in time to start work next season.

In these days no one man can follow all branches of science, and most people find it sufficient to try to keep abreast of a single, limited branch. Chemistry, both mineral and organic, mineralogy, bacteriology, botany, physics, and engineering, are all necessary for the study of the soil, and it is by team work in which persons skilled in a number of different

branches of knowledge co-operate, that a successful research institute is built up. It is the intention to appoint a team of workers skilled in the principal branches of science which bear on the soil, who have already had experience in the application of their knowledge to agriculture and especially to problems of the soil and its fertility.

It was recorded in the last volume of the 'Transactions' that certain branches of the soil research in Aberdeen had been brought practically to a standstill owing to the unexpected loss we suffered through the early death of Mr Newlands, the Advisory Officer in Soils. In view of the foundation of the Macaulay Research Institute at Aberdeen, no successor has been appointed to Mr Newlands, as the important work which he had carried on for years will be taken over by the new Institute.

The investigations into the composition of soil drainage, and the losses which the soil suffers through drainage, have been continued, but as a paper on this branch of the work by Professor Hendrick is included in the present volume of the 'Transactions,' pp. 1-27, nothing further need be said on this subject here.

THE HANNAH DAIRY RESEARCH INSTITUTE.

THE UNIVERSITY, GLASGOW.

I. ESTABLISHMENT AND DEVELOPMENT OF THE INSTITUTE.

The project of establishing a Scottish Institute for Research in Dairying was under consideration for a number of years, but its immediate establishment in the south-west of Scotland was made possible through the generosity of Mr J. M. Hannah of Girvan Mains, Girvan. By his gift of Auchincruive estate, near Ayr, for the joint purposes of agricultural education and research, Mr Hannah enabled the Institute to acquire the farm of Kirkhill, Auchincruive, and certain lands adjoining, the whole extending to about 120 acres.

The Institute entered into occupation of the farm in November 1929. Building was immediately commenced, and is proceeding rapidly. A considerable extension of the farm buildings has been effected, while the existing buildings have been largely remodelled. The completed farm buildings will be adequate to accommodate a herd of twenty milking cows, together with young stock. Meanwhile plans for the new laboratories of the Institute have been drawn up, and a start has been made on the foundations of the building on a site adjacent to the steading. Accommodation has been pro-

vided for workers in physiology and biochemistry, pathology and bacteriology, and dairy husbandry; while the building also includes a spacious library, offices, a small animal house, and apartments for a caretaker. It is anticipated that the laboratories will be ready for occupation in the early autumn of 1930.

The Institute is governed by a Joint Committee of Management, consisting of representatives of the University of Glasgow, the West of Scotland Agricultural College, and the Department of Agriculture for Scotland, with Sir Donald MacAlister as Chairman. The funds of the Institute are provided from the Development Commissioners and from other Government sources, but grants are only made by the former body on the condition that one-third of the annual maintenance expenditure is provided from non-Government sources. The Institute is therefore largely dependent on public support for the development of its work.

II. RESEARCH IN PROGRESS.

Tuberculosis in Dairy Cows.—A survey of the extent of re-infection of cows in tuberculin-tested herds has been carried out, and considerable data has been collected on the probable causes of such re-infection. A detailed report of this work is at present in course of preparation.

An experimental scheme of eradication of bovine tuberculosis has been initiated by the Institute in a small area in Ayrshire. The area extends to approximately nine square miles, and comprises some thirty typical dairy farms. The work undertaken by the Institute includes (1) free tuberculin-testing by the double intradermal method, (2) supervision of the isolation of reactors and of the rearing of young stock, and (3) comparative tests of the infection of the milk at various stages of eradication. A special Committee of the Medical Research Council is co-operating with the Institute in the general supervision of the scheme, while the Institute has secured the collaboration of the local veterinary practitioner in carrying out a part of the field work.

An examination has been made of existing data on the tuberculous infection of the milk supplies of Scottish cities, and a summary of the results published. These results show that existing data are inadequate, owing to variations in the technique of testing at each centre, and indicate the need for more extensive investigations to be carried out before any final conclusion can be reached as to the present state of infection of the milk supply.

Physiology of Milk Secretion.—An investigation into the physico-chemical mechanism of calcium and phosphorus

secretion has been completed, and the results published. Work is now being directed towards a further problem—namely, the elucidation of the factors controlling the secretion of the nitrogenous constituents of milk. This work is being combined with a general study of the nitrogen metabolism of the milking animal, particularly in relation to the protein requirements for milk production.

Utilisation of Milk Residues.—At the request of the Scottish National Milk and Health Association, the Institute undertook to edit and publish a report on the extent, and methods of utilisation, of surplus milk and milk residues (separated milk and whey) in Scotland. This report had been prepared by Mr A. MacNeillage, Jun., and indicated the very considerable wastage of milk residues at present existing in this country.

In order to supplement this report—particularly as far as the chemical and bacteriological aspects of utilisation are concerned—a survey is now being made of the complete scientific literature relating to the condensing and drying of milk and milk residues, so that any future work undertaken may be carried out on a sound basis.

At the same time, the Institute is co-operating with the Royal Technical College, Glasgow, in a study of the mechanical aspects of milk drying by the so-called Spray Process.

Other Investigations.—An attempt is being made to ascertain the coefficient of relationship and the coefficient of in-breeding in the Ayrshire breed of dairy cows, as a preliminary to more extended work on the inheritance of yield and quality of milk.

Investigations have been carried out, in conjunction with the Animal Diseases Research Association and the Royal (Dick) Veterinary College, into the methods of curing and/or preventing milk fever in dairy cows. An account of the results of this work is included in the report of the former institution.

MILK RECORDS.

TWENTY-SEVENTH YEAR—RECORDS OF 30,898 COWS.

By WILLIAM STEVENSON, B.Sc., N.D.A., N.D.D., Superintendent,
The Scottish Milk Records Association.

SYSTEMATIC milk recording in Scotland was continued in 1929 under the direction of the Scottish Milk Records Association on the same lines as in 1928 and previous years. The scheme of private or unofficial milk records for unregistered herds inaugurated in 1924 was also continued during this year.

The Association in 1929 consisted of the following members :

Name and Address.	Body Represented.
Mr John Robson, Jun., Lynegar, Watten .	Caithness Milk Recording Society.
Mr Thos. Barr, Hobsland, Monkton .	Central and South Ayrshire Milk Recording Society (5 Circuits).
Mr William D. M'Cubbin, Lochlands, Maybole	
Mr William D. Wardrop, Rigg, Auchinleck .	
Mr Andrew Wilson, Finlayston, Ochiltree .	
Mr George Templeton, Carnell Farm, Hurlford	
Mr Alex. Y. Allan, Aitkenbar, Dumbarton .	Central Ayrshire No. 2 Milk Recording Society.
Mr James Armstrong, Castlehill, Lockerbie	Dumbartonshire Milk Recording Society.
Mr Robt. Millar, Shawsholm, Closeburn .	Dumfriesshire Milk Recording Society (3 Circuits).
Mr Mungo Sloan, Hunterhouse, Lochmaben .	East Kilbride and District Milk Recording Society (2 Circuits).
Mr Alex. Paterson, Cathburn, Newmains .	
Mr F. A. Rottenburg, Blaierassan, Killearn .	East Lothian and Border Milk Recording Society.
Mr Robert M. Broadfoot, Whitekirk Mains, Prestonkirk	East Stirlingshire Milk Recording Society.
Mr Robt. M. Reid, The Glen Farm, Falkirk	Fenwick (High) Milk Recording Society.
Hon. G. Corbett, Rowallan, Kilmarnock .	Fife Milk Recording Society (2 Circuits).
Mr William M'Adam, Athronhall, Milnathort	
Mr James W. Miller, Lochhead, East Wemyss	
Mr D. F. Mackenzie, Parks of Inches, Inverness	Highland Milk Recording Society.

Name and Address.	Body Represented.
Mr J. Taylor, Mulindry, Bridgend . . .	Islay Milk Recording Society.
Mr Andrew Craig, Ryesholm, Dalry . . .	"John Speir" Milk Recording Society.
Mr Robert Young, Drum, Kilkenzie . . .	Kintyre Milk Recording Society.
Mr John T. Kirkwood, B.Sc., N.D.A., Scorrieholm, Lesmahagow	Lesmahagow Milk Recording Society.
Mr Andrew C. M'Candlish, Ph.D., B.Sc., Claunch, Sorbie	(Lower Wigtownshire Milk Recording Society (2 Circuits).
Mr Alexander M. Owen, Culnoag, Sorbie . .	Montgomerie Milk Recording Society.
Mr Jas. J. Howie, Eglinton Mains, Irvine	{ North of Scotland Milk Recording Society (2 Circuits).
Mr John A. Carlyle, B.Sc., Prudential Buildings, Arbroath	{ Renfrew and Bute Milk Recording Society (2 Circuits).
Mr Robert Howie, Flatterton, Greenock . .	{ Renfrewshire (Upper Ward) Milk Recording Society.
Mr John Telfer, Branchal, Bridge of Weir . .	Rhins of Galloway Milk Recording Society (5 Circuits).
Mr James Whiteford, Caldcoats, Newton Mearns	Stewarton and Dunlop Milk Recording Society.
Mr Andrew Cochran, High Ardwell, Kirkcolum	
Mr John Forster, Mains of Larg, New Luce	
Mr Alex. M. M'Caig, Challoch, Stranraer . .	
Mr James Wither, Awhirk, Stoneykirk . . .	
Mrs Eadie, Hazelbank, Dunlop	
Mr H. G. Baird, Kirkchrist, Kirkeudbright	Stewarton and Dunlop Milk Recording Society.
Mr Graham Clement, Howwell, Kirkeudbright	
Mr H. W. B. Crawford, Forneth, Castle-Douglas	Stewarton and Dunlop Milk Recording Society (5 Circuits).
Major C. R. Dudgeon, Cargen Holm, Dumfries	
Mr William P. Gilmour, Balmangan, Borgue	
Mr Eben More, Dalnacouther, Airdrie . . .	West Lothian Milk Recording Society.
Col. W. T. R. Houldsworth, Kirkbride, Maybole	
Mr James Howie, Hillhouse, Kilmarnock . .	The Ayrshire Cattle Herd - Book Society of Great Britain and Ireland.
Mr Jacob S. Murray, Dalgig, New Cumnock	
Mr A. W. Montgomerie, Westburn, Cambuslang	
Mr Matthew Bowie, Balmuildy, Maryhill, Glasgow	{ The British Friesian Cattle Society.
Mr George Pirie, Riccartbar, Paisley . . .	
Mr T. J. Anderson, Cairnfield, Lerwick . .	The Shetland Cattle Herd-Book Society.
Mr Matthew White, M.R.C.V.S., Sandayre Villa, Lerwick	
Mr Alex. Munro, Leanach, Culloden Moor . .	The Highland and Agricultural Society of Scotland.
Mr Alex. Murdoch, East Hallside, Hallside .	
Mr W. P. Gilmour, Balmangan, Kirkeudbright	

Name and Address.	Body Represented.
Mr T. C. Lindsay, New Dykes, Monkton .	The West of Scotland Agricultural College.
Mr J. F. M'Gill, of M'Gill & Smith, Ltd., Ayr	
Principal W. G. R. Paterson, 6 Blythswood Square, Glasgow	
Mr Harry Armour, 16 Murrayfield Road, Edinburgh	The Edinburgh and East of Scotland College of Agriculture.
Mr Alexander Lauder, D.Sc., 13 George Square, Edinburgh	
Principal E. Shearer, 13 George Square, Edinburgh	
Mr G. G. Esslemont, M.B.E., B.Sc., 41½ Union Street, Aberdeen	The North of Scotland College of Agri- culture.
Professor J. Hendrick, Marischal College, Aberdeen	
Mr J. F. Tocher, D.Sc., 41½ Union Street, Aberdeen	
Mr Robert Dickie, Knockenjig, Sanquhar .	Co-opted Members.
Mr James Dunlop, Midland, Prestwick .	
Mr George Hobson, 4 Southampton Row, London, W.C.1	
Mr Robert Laird, Lawthorn, Irvine . . .	
Sir Hugh Shaw Stewart, Bart., C.B., Ardgowan, Inverkip	

Chairman—Mr James Dunlop.

The following were the principal members of the staff :—

Secretary and Treasurer—Mr John Howie.

Superintendent—Mr William Stevenson, B.Sc., N.D.A., N.D.D.

Assistant Superintendent—Mr Percy H. Hart.

SCHEME OF OFFICIAL MILK RECORDS.

ADMINISTRATION.

In 1929, as in previous years, the scheme of official milk records was administered by the Association through local Milk Recording Societies. The grant from the Development Fund, obtained through the Board of Agriculture for Scotland, was continued in 1929 on the same conditions as in the previous year, though the amount authorised was reduced to £2650, compared with £3000 for 1928 and £3350 for 1927. Owing to the reduction in the Treasury grant the Association were unable to give the usual grants to local societies for new members.

The Ayrshire Cattle Herd-Book Society continued their grant of £50 to the Association.

Grants were allocated to local societies on the following scale :—

1. Societies testing at intervals of not more than twenty-one days :—

- (a) The hire of the necessary milk-testing appliances free of annual charge, the society to upkeep the apparatus in good condition.
- (b) An annual grant of 9s. 6d. per member towards the cost of surprise check tests.

2. Societies testing at intervals of from twenty-two to twenty-eight days :—

- (a) The hire of the necessary milk-testing appliances free of annual charge, the society to upkeep the apparatus in good condition.
- (b) An annual grant of 8s. per member towards the cost of surprise check tests.

During the latter part of 1928 and the earlier months of the year every effort was made to obtain additional applications for membership of local societies in 1929 throughout the various dairying districts of Scotland, and 64 definite applications were received. But for various reasons, such as the continued acute depression in the industry, and members disposing of their dairy herds, or changing their farms, abortion in herds, &c., there were more than the usual number of resignations.

All the local societies which operated in 1928 continued in 1929; though two societies in less intensively dairying districts, with comparatively long distances between members—namely, the East Lothian Society and the Roxburgh and District Society,—with a view to economy in working, amalgamated to form one larger society, the East Lothian and Border Society. A motor-car is provided for the recorder as more convenient for the longer journeys between members.

The number of recorders' circuits in 1929 was 43; the number of herds officially tested, 734; and the total number of cows officially tested, 30,898, compared with 30,293 in 1928—an increase of 605 cows, and the largest number in the history of the Association. The position in 1929 was considered satisfactory under the conditions prevailing in the industry, when the majority of agricultural societies or associations were unable to maintain their former membership.

The following is a list of the Milk Recording Societies

which operated in 1929, with the name and address of the Secretary of each society:—

Name of the Society.	Secretary.
Caithness	Mr John Robson, Jun., Lynegar, Watten.
Central and South Ayrshire (5 Circuits)	Mr E. A. Bell, M.A., B.Sc., 5 Alloway Street, Ayr.
Central Ayrshire No. 2 .	Mr James Cochran, N.D.A., Holmes Farm, Kilmarnock.
Dumbartonshire . . .	Mr John Bilsland, Quay Place, Dumbarton.
Dumfriesshire (3 Circuits)	Mr Thomas Henderson, Solicitor, Lockerbie.
East Kilbride and District (2 Circuits)	Mr Arthur Gilmour, C.A., 23 Silvergrove Street, Glasgow.
East Lothian and Border	Mr James L. Nisbet, Easter Newton, Kirknewton.
East Stirlingshire . . .	Mr Robert M. Reid, The Glen Farm, Falkirk.
Fenwick (High). . . .	Mr Thomas Murdoch, West Tannacrieff, Kilmarnock.
Fife (2 Circuits) . . .	Mr William Macniven, The Nook, Southerton Road, Kirkcaldy.
Highland	Mr J. M. Hunter, Queensgate, Inverness.
Islay	Mr D. M'Millan, Eorrabus, Bridgend.
"John Speir"	Mr William Longwill, Hawhill, Dalry.
Kintyre	Mr Robert Young, Drum, Kilkenzie.
Lesmahagow	Mr Gavin Hamilton, British Linen Bank, Lesmahagow.
Lower Wigtownshire (2 Circuits)	Mr David Breckenridge, Solicitor, Newton-Stewart.
Montgomerie	Mr Robert Laird, Lawthorn, Irvine.
North of Scotland (2 Circuits)	Mr John A. Carlyle, B.Sc., Prudential Buildings, Arbroath.
Renfrew and Bute (2 Circuits)	Mr Thomas Hunter, Solicitor, 24 High Street, Paisley.
Renfrewshire (Upper Ward)	Mr William Henderson, Old Crookston, Nitshill.
Rhins of Galloway (5 Circuits)	Mr John Gibson, Solicitor, Stranraer.
Stewarton and Dunlop .	Mr John Craig, Caudhame, Dunlop.
Stewartry of Kirkcudbright (5 Circuits)	Mr Patrick Gifford, Solicitor, Castle-Douglas.
West Lothian	Mr John Crooks, Little Ochiltree, Uphall.

SEASON 1929.

The table on the following page shows for each society the number of herds, the number of cows tested, the average interval between the tests, and the duration of the recording season:—

Name of the Society or Circuit.	No. of Herds.	No. of Cows Tested.	Average interval between Tests, in Days.	Duration of Ke-cording Season, in Weeks.
1. Caithness	1	13	21	52
Central and South Ayrshire—				
2. Ayr and Coynton	18	635	21	52
3. Cumnock and District	18	544	21	52
4. Girvan and Maybole	16	765	21	52
5. Kilmarnock and Monkton	18	708	21	52
6. Mauchline and Drongan	18	601	21	52
7. Central Ayrshire No. 2	18	700	21	52
8. Dumbartonshire	18	568	28	52
Dumfriesshire—				
9. Mid Annandale	21	900	28	52
10. Upper Annandale	21	893	28	52
11. Upper Nithsdale	20	870	28	52
East Kilbride and District—				
12. East Kilbride and District	20	714	28	52
13. Hamilton and District	20	652	28	52
14. East Lothian and Border	22	786	28	52
15. East Stirlingshire	18	547	23	52
16. Fenwick (High)	17	639	21	52
Fife—				
17. Dunfermline and Kirkcaldy	20	648	26	52
18. Cupar-Fife and Perth	21	520	24	52
19. Highland	21	691	27	52
20. Islay	4	102	21	41
21. "John Speir"	17	528	21	52
22. Kintyre	18	836	24	52
23. Lesmahagow	18	572	28	52
Lower Wigtownshire—				
24. Whithorn and Port William	13	754	21	52
25. Newton-Stewart and Wigtown	14	831	21	52
26. Montgomerie	14	507	28	52
North of Scotland—				
27. Forfarshire and Kincardineshire	17	509	28	52
28. Aberdeen and District	22	779	28	52
Renfrew and Bute—				
29. Bute and Inverkip	17	511	25	52
30. Paisley and Kilmacollm	17	565	23	52
31. Renfrewshire (Upper Ward)	17	669	21	52
Rhins of Galloway—				
32. Kirkcollm and District	15	1034	21	52
33. Kirkmaiden and District	14	1209	26	52
34. Leswalt	15	1093	21	52
35. Luce Valley	15	956	23	52
36. Stranraer and District	15	1088	23	52
37. Stewar-ton and Dunlop	13	452	21	52
Stewartry of Kirkcudbright—				
38. Dalbeattie and New Abbey	19	839	25	52
39. Castle-Douglas & New Galloway	19	947	25	52
40. Castle-Douglas and District	18	982	24	52
41. Kirkcudbright and District	19	1093	25	52
42. Borgue, Twynholm, & Gatehouse	19	937	25	52
43. West Lothian	19	711	25	52
Total No.	734	30,898	...	...

DEFINITIONS.

The milk records compiled by the Association are records of the estimated quantity of milk produced by each cow in a separate lactation, and of the estimated percentage of milk fat contained in the milk. For convenience a gallon of milk was reckoned as 10 lb. A gallon of milk of average quality weighs almost exactly $10\frac{1}{2}$ lb. The following further particulars concerning each record were also given wherever possible :—

Name of cow, byre number, and herd-book number.

Sire of cow, and herd-book number of sire.

Dam of cow, and herd-book number of dam.

Date of birth.

Date of calving preceding opening of record.

Number of weeks in milk.

Date of next calving after record closed.

The following particulars of the preceding record were appended to each record, where available :—

Date of calving preceding opening of record.

Quantity of milk in gallons.

Percentage of fat in milk.

Number of weeks in milk.

The milk yields were estimated in respect of quantity and milk-fat percentage from the results of systematic periodic tests by trained recorders approved by the Association. The recorders visited the farms for this purpose at intervals varying from twenty-one to twenty-eight days, and each day of visit was regarded as the middle day of the period covered by the visit. Milk records estimated in this way approximate closely to the actual milk yields.

METHOD OF RECORDING ADOPTED—OFFICIAL RECORDS.

A distinctive feature of milk recording in Scotland in 1929, as in former years, was that the official records were entirely the work of trained official recorders. Recorders had previously to undergo a special course of training in milk recording at the Dairy School for Scotland at Kilmarnock, or other approved College of Agriculture. Only candidates of good character and good general education were selected to attend these courses; and all recorders, before appointment, were approved by the Executive Committee of the Association.

Fuller details of the method of recording adopted will be found in the Association's annual report. The byre sheets were written out in duplicate. The principal copies were posted at regular intervals to the office of the Association, and the carbon copies left with the respective members.

The recorder transferred the results from the extended byre sheet to the milk record book for the herd indelibly in ink : each cow being assigned a separate page, at the top of which full particulars of the cow were entered, including the indelible tattoo marks on the animal.

The byre sheets were carefully revised and corrected in the Association's office during the season, and a list of the necessary corrections sent to each recorder periodically to be entered in the record books.

Visits of inspection were made to each recorder and to the members of local societies at the different farms periodically throughout the year by members of the Association's staff, and reports thereon submitted to the Executive Committee. The Executive Committee reserved the right to withdraw approval of any recorder at any time or to limit the period of service of any recorder with any particular society. Members of local societies refusing to observe any of the rules of the Association, or deemed to be guilty of conduct injurious to the true interests of milk recording, were liable to be temporarily or permanently suspended.

Another distinctive feature was the surprise check tests, the records of each herd being checked in this way about two or three times throughout the year. The recorder was instructed, by a letter from the Superintendent on a date unknown to recorder and owner of herd, to remain at the same farm another day and make another complete twenty-four hours' test. The surprise test results were entered on special buff-coloured byre sheets, and in the record books in red ink immediately below the results of the regular test of the previous day. The buff byre sheets were posted to the Association's office with the other sheets, and any abnormal differences were immediately noted and reported to the Executive Committee.

As a result of this system of surprise check tests, each page of the 1929 milk record books contains two or three lines of entries in red, comparison of which with the immediately preceding entries provides valuable evidence as to the genuineness of the milk records.

In addition to the surprise check tests made by the recorder, a number of independent surprise tests were made by the Association's staff, in order to check the recorder's work.

All records were closed at the end of December, the current lactations being carried forward to the new books of the following year. Finally, summary sheets were written out in duplicate showing the total milk yields for each cow for the lactation or part lactation, with full particulars of the cow, dates of calving, &c. The principal copy of the summary sheet was posted to the Association's office with the record book, and the second copy left with the owner of the herd.

All record books and summary sheets were carefully revised, corrected in detail, and initialled in the Association's office during the next few months, the record books being returned later to the respective members, and the summary sheets retained and bound for future reference.

The milk records were next classified into three groups for cows and heifers respectively, on the following basis. Experience has confirmed the view that a very useful comparison is obtained by reckoning the yields at their estimated equivalent of milk of 1 per cent fat. Such a comparison takes into consideration both the quantity and the quality of the milk.

Cows with a milk record equivalent to not less than 2500 gallons at 1 per cent fat, and heifers with a milk record equivalent to not less than 2000 gallons at 1 per cent fat, were grouped into Class I. Cows and heifers with milk records of less than two-thirds of these amounts—viz., 1660 and 1330 gallons respectively—were grouped into Class III.

The following short table shows the corresponding values of these yields in fairly good milk of 3·5 per cent milk fat :—

Class.	Yield in Milk of 1 per cent Fat. (Gallons.)	Corresponding Yield in Milk of 3·5 per cent Fat. (Gallons.)
Cows in Class I . .	Not less than 2500 .	714
Heifers in Class I. .	Not less than 2000 .	571
Cows in Class III. .	Less than 1660 .	474
Heifers in Class III. .	Less than 1330 .	380

All cows and heifers falling between these limits would come into Class II. Such animals naturally claim less attention than the good milkers or the obviously unprofitable animals. It should be noted, however, that Class II. would include a certain number of unclassified yields, as there were a number of instances where, from various causes, the results of a whole normal lactation could not be obtained.

The Association will shortly publish an Annual Report giving all details of the work of the Association, and of each local Milk Recording Society during 1929. This report will include tables showing for each farm the number of cows and heifers tested and the number and percentage included in Classes I. and III. respectively. Each herd is included under the respective local society, but is represented only by an alphabetical letter, the owner being advised privately of the identity in the report of his own herd or herds. From these tables any member may see at a glance how his herd compares with other herds in the same or any other district, and the improvement in his own herd compared with previous

years. The report will also show in tabular form the percentage of Class I. and Class III. animals of all animals tested under the Association's scheme during the year, and will thus afford a valuable indication of the progress in milk production generally.

An important feature of the Association's annual reports, from 1917 inclusive, is the register of good milking cows with the names and addresses of owners and full particulars of the milk records. This register includes only the records of animals with a milk yield equivalent to not less than 2800 gallons containing 1 per cent of milk fat in the case of a cow, and 2240 gallons containing 1 per cent of milk fat in the case of a heifer, and is further restricted to animals which completed their lactations before the end of the year and gave birth to another calf within not more than fifteen months of date of previous calving. Full particulars of each record are given, and all lists of records are submitted to the owners of the respective animals for revision before publication. The register is of great value to all interested in increased milk production and in the breeding and rearing of animals of the best milking strains, and is invaluable for reference.

It should always be kept in mind when making a comparison of cows in different herds or in different districts, that the different methods of dairying practised have a considerable influence on the milk yields, and that therefore milk yields alone do not necessarily indicate the true relative inherent or hereditary milking qualities of the animal. But the authenticated milk records compiled by the Association are of inestimable value to breeders and owners of dairy cows if properly interpreted.

REVIEW OF 1929—OFFICIAL RECORDS.

Recording was carried on in 1929 by 43 local societies or circuits, comprising 734 members. The number of cows tested in 1929 was 30,898, compared with 30,293 in 1928, an increase of 605 cows, and the largest number officially tested in the history of the Association.

The percentage of dairy cows regularly recorded in Scotland compares very favourably with that of other countries. With the exception of Denmark, where milk recording was introduced earlier than in Scotland, and where conditions prevail more favourable to movements organised on a co-operative basis, Scotland contains a higher proportion of recorded cows than any other country in the world.

During the year 18 recorders, for various reasons, terminated their engagements. The Executive Committee, however, in the same period approved of 27 applicants for the position

of milk recorder, and were able to recommend a sufficient number of qualified recorders. Thirteen women recorders were employed in 1929, and 41 men recorders.

In this connection the Committee, as formerly, were indebted to the West of Scotland Agricultural College for giving special courses of instruction for milk recorders to meet the Association's requirements. Only one special course was required in 1929—namely, in December. Twenty-six selected candidates attended the course, and 23 obtained the certificate.

The Executive Committee purchased the supplies of milk-testing apparatus, sulphuric acid, and amyllic alcohol for local societies, as in previous years.

The system of surprise check tests, introduced in 1920, was continued in 1929. The total number of check tests made by recorders during the season was 1175, or an average of approximately two check tests per herd tested throughout the whole season. In no instance in 1929 was the average milk yield for the herd more than 3 lb. milk daily less on the occasion of a check test, as compared with the previous day. Only 5 herds showed an average of over $2\frac{1}{2}$ lb. less, and only 6 herds an average of over 2 lb. less, including the 5 herds already referred to. In addition to the surprise tests arranged for and carried out by the recorders, the Assistant Superintendent made 40 special check tests of different herds. The results in most instances agreed very closely in regard both to average milk yields and fat percentages with those of the recorders' previous tests. Only three herds showed an average daily yield of over 2 lb. less on the occasion of a special check test, and only one herd had an average of over 2 lb. more. With regard to average fat percentages, no herd showed an average fat percentage of over .2 per cent lower, and only two herds an average of over .2 per cent higher. With the exception of two herds, the average fat percentages were all within .2 of those obtained by the recorders at the previous tests.

With regard to the general conditions for milk production in 1929, the weather during the year was not unfavourable on the whole. Pastures were bare throughout the spring, and it was not until May that they improved to any extent; thereafter grass was generally abundant throughout the season. In most dairying districts the hay crop was harvested under favourable weather conditions and was secured in excellent order; the yield showed considerable variation, but, on the whole, was satisfactory. Turnips and swedes made good progress later in the season, and were a good average crop. But prices generally for milk and milk products remained low relative to costs of production, in the case of the latter due to highly organised foreign competition, and of the former largely to opposing interests creating difficulties in marketing. Economic conditions did not encourage owners

to produce the best possible milk yields from their herds. From the financial point of view the position was further aggravated by the unprecedented slump in prices of oats and potatoes, and the year was probably the worst of the series of nine or ten poor years in succession.

In the case of recorded herds, other conditions militated against a higher average yield. As in recent years, a very considerable proportion of herds which had been recorded for a period of years were entirely dispersed, or for other reasons already referred to did not continue to be recorded, while a considerable number of 'new herds,' or herds tested for not more than three years, were included. The proportion of regular milk record herds was thereby correspondingly reduced.

The following table shows for each society or circuit the number and percentage of cows and heifers of each class in 1929, with a comparison of the average results from 1914 to 1929 inclusive :—

Society or Circuit.	Cows and Heifers				
	Number.			Per Cent.	
	Total.	Class I.	Class III.	Class I.	Class III.
1. Caithness	13	4	1	31	8
Central and South Ayrshire—					
2. Ayr and Coylton	635	434	4	78	1*
3. Cumnock and District	544	146	...	84	...*
4. Girvan and Maybole	765	581	5	76	1
5. Kilmarnock and Monkton	708	440	9	69	1*
6. Mauchline and Drongan	601	451	10	76	2*
7. Central Ayrshire No. 2	700	577	1	85	...*
8. Dumbartonshire	568	367	11	65	2*
Dumfriesshire—					
9. Mid Annandale	900	634	12	72	1*
10. Upper Annandale	893	629	10	71	1*
11. Upper Nithsdale	870	559	23	64	3
East Kilbride and District—					
12. East Kilbride and District	714	431	9	61	1*
13. Hamilton and District	652	408	11	63	2
14. East Lothian and Border	786	592	4	77	1*
15. East Stirlingshire	547	386	2	74	...*
16. Fenwick (High)	639	453	2	74	...*
Fife—					
17. Dunfermline and Kirkcaldy	648	536	1	83	...
18. Cupar-Fife and Perth	520	287	9	67	2*
19. Highland	691	467	8	76	1*
20. Islay	102	9	6	9	6
21. "John Speir"	528	333	6	63	1

Society, or Circuit.	Cows and Heifers.				
	Number.			Per Cent.	
	Total.	Class I.	Class III.	Class I.	Class III.
22. Kintyre	836	506	8	61	1
23. Lesmahagow	572	398	7	74	1*
Lower Wigtownshire—					
24. Whithorn and Port William	754	403	37	53	5
25. Newton-Stewart and Wigtown	831	475	31	57	4
26. Montgomerie	507	382	4	75	1
North of Scotland—					
27. Forfarshire and Kincardineshire	509	403	1	80	...*
28. Aberdeen and District	779	439	21	63	3*
Renfrew and Bute—					
29. Bute and Inverkip	511	345	6	68	1
30. Paisley and Kilmacolm	565	366	5	65	1
31. Renfrewshire (Upper Ward) Rhins of Galloway—	669	401	6	62	1*
32. Kirkcolum and District	1034	753	9	73	1
33. Kirkmaiden and District	1209	890	11	76	1*
34. Leswalt	1093	523	19	61	2*
35. Luce Valley	956	522	41	55	4
36. Stranraer and District	1088	729	25	67	2
37. Stewarton and Dunlop	452	351	3	78	1
Stewartry of Kirkcudbright—					
38. Dalbeattie and New Abbey	839	553	29	66	3
39. Castle-Douglas and New Galloway	947	607	20	66	2*
40. Castle-Douglas and District	982	543	26	57	3*
41. Kirkcudbright and District	1093	665	24	68	2*
42. Borgue, Twynholm, and Gatehouse	937	575	26	63	3*
43. West Lothian	711	471	17	67	2*
Of all the cows and heifers tested in 1929					
Comparison with 1928	30,898	20,324	520	68	1½*
Comparison with 1927	30,293	19,227	741	66	2½
Comparison with 1926	29,459			65½	2½
Comparison with 1925	29,236			65½	2½
Comparison with 1924	28,410			60	5
Comparison with 1923	27,957			65	3
Comparison with 1922	26,952			65	2
Comparison with 1921	27,275			63	2
Comparison with 1920	26,752			58½	4
Comparison with 1919	24,191			55½	3½
Comparison with 1918	20,786			49½	4½
Comparison with 1917	17,827			49	5½
Comparison with 1916	19,564			50	4½
Comparison with 1915	22,702			53½	4½
Comparison with 1914	26,572			46	6
Comparison with 1914	26,424			39½	9

Excluding herds tested during only a part of the recording season—
1061 cows in all.

Reviewing the results of the 43 circuits as a whole, we find that of the total of 30,898 cows and heifers tested in 1929, excluding 1061 animals in herds tested during only a part of the season, and therefore not classified, 20,324 were included in Class I., and only 520 in Class III. This is equivalent to 68 per cent in Class I. and $1\frac{1}{2}$ per cent in Class III. Thus, 68 per cent of all the cows and heifers tested gave a milk yield equivalent to not less than 714 gallons containing 3.5 per cent milk fat in the case of a cow, and 571 gallons in the case of a heifer; while only $1\frac{1}{2}$ per cent gave a milk yield equivalent to less than 474 gallons containing 3.5 per cent milk fat in the case of a cow, and 380 gallons in the case of a heifer. In 1928, 66 per cent were eligible for Class I., and $2\frac{1}{2}$ per cent were included in Class III.

The average standard attained in 1929 was undoubtedly lowered by the inclusion of the considerable proportion of 'new' herds, and by the adverse trading conditions already referred to, yet it will be observed from the preceding table that the proportion of animals qualifying for inclusion in Class I. in 1929 is the highest reached since the commencement of official milk recording twenty-seven years ago.

It will be observed also that the proportion of good milking or Class I. cows and heifers to the total animals tested has increased from $39\frac{1}{2}$ per cent in 1914 (when the present basis of classification was adopted) to 68 per cent in 1929; while the proportion of Class III., or obviously unprofitable, animals has been reduced in the same period from 9 per cent to $1\frac{1}{2}$ per cent. These figures indicate a large increase in the volume of milk produced during the last fifteen years, yet do not represent the full extent of the progress made in tested herds since the introduction of milk recording in 1903. It is estimated that milk record herds generally are at the present time giving higher average yields than unrecorded herds to the extent of over 200 gallons per cow per annum.

But improvement from milk recording is not confined wholly to herds officially recorded in 1929. A very much larger number, about twice as many herds, have been tested and recorded for longer or shorter periods since the Association's scheme of milk recording was introduced. And when we consider the spread or diffusion of the benefits arising directly or indirectly from milk recording, we find that these penetrate widely in various directions other than that of individual members of milk recording societies. For example, there is the effect on the remaining four-fifths of the dairy herds of the country. The wide dissemination annually of milk record stock bulls and milk record cows for breeding purposes among untested herds alone must exercise an incalculable improving influence on a very large number of these herds. And such influence is increasing

with the rapid extension of the practice of using only milk record bulls in dairy herds.

Also, there is the powerful educational influence and force of example permeating and leavening the whole mass of dairy farmers, and gradually creating a new habit of thought in the realm of milk production. If a census could be taken in this connection, it would probably be found that a very considerable proportion of herd owners outside the membership of milk recording societies are in one way or another testing and recording the milk yields of their herds who would never have done so had systematic or official milk recording not been in operation. The same consideration applies to the more enlightened methods of selecting, breeding, and feeding on milk record lines, which have been adopted in many herds not officially recorded.

But there is another direction in which advantage from milk recording is penetrating widely beyond the ranks of milk recording societies. Increased home production of milk tends to lower the cost to the urban populations, and some portion of the return from milk recording is handed on beyond the actual milk producers. Indeed, the general economic position in the milk industry to-day supports the contention that the advantages of milk recording are to a large extent absorbed in this direction. Even good-milking cows are leaving only a small margin of profit to the producer.

There remains a still wider aspect of the question. Large numbers of milk record bulls and young cows are exported annually, and go to maintain and improve the milking qualities of the dairy herds of the Empire. Every stage of progress in this direction is a step forward to the goal of a self-supporting community of nations under the British flag.

It is evident, therefore, that there may be a genuine development other and more valuable than in numbers. And the question naturally arises as to how the very modest grant obtained from the Treasury for official or systematic milk recording in Scotland could be spent in any other direction to ensure a better return.

NEW SCHEME OF PRIVATE OR UNOFFICIAL MILK RECORDS.

The Association's new scheme of private or unofficial milk records, inaugurated in 1924, was continued in 1929 on the same lines as in previous years. The chief objects are to establish milk recording on a wider and more popular basis, and to induce a greater number ultimately to adopt the system of official authenticated milk records.

Milk recording under this scheme was administered directly

by the Association. The following inducements were offered to members :—

- (a) The hire of a set of appliances for testing purposes, free of annual charge, the member to upkeep the apparatus in good condition.
- (b) Byre sheets and record books free of charge, with stamped addressed envelopes for return of byre sheets.
- (c) All calculations in byre sheets and record books to be made in the Superintendent's office, and the sheets and record books to be returned to the herd owners duly extended and completed.
- (d) The total charge on members to be limited to an annual subscription to the Association at the rate of 1s. 3d. per cow tested.

One hundred and twenty of the 155 members of 1928 continued in 1929, and 20 new members were enrolled. Six of the members were transferred to the scheme of official recording for season 1929. The total membership for 1929 was 134, and the total number of cows included 2464. This shows a decrease of 21 members for unofficial records. But, on the other hand, this new scheme of recording had in 1929 already been the means of obtaining for official recording 30 new members of a very desirable type, which is one of the objects for which it was promoted.

There are several reasons why the membership under this scheme for any given year cannot be expected under present conditions to show any great increase. The better milking herds are being transferred to official records. Further transfers have been arranged for season 1930. At the other extremity there are a considerable number of very poor herds, the owners of which are evidently unduly discouraged by the very low yields recorded, and apparently have not the mentality to appreciate the possibilities of effecting the much-needed improvement. In addition, the charge for recording which the Association have been compelled to make is considered by the general body of members and prospective members to be excessive, and, as was anticipated, is proving a severe handicap on all efforts to make the scheme popular among the rank and file of dairy farmers. It is the reason given by a considerable number of members for severing their connection with the Association, as they find after about two years' experience they can carry on recording on similar lines independently at smaller cost.

But this new scheme of unofficial recording is undoubtedly serving a most useful purpose. For reasons already given, its effect must not be measured merely by the number of herds included in any particular year; account must be taken also of its educational influence and propaganda value. Thus

a considerable proportion of the members who have resigned and meantime severed their connection with the Association have formed the milk recording habit, and ought ultimately to be found among members of milk recording societies. But if only the charge could be reduced to that originally recommended by the Association—namely, 6d. per cow—an extension of the movement might confidently be expected.

The following is a brief outline of the method of recording adopted:—

All cows in the herd yielding milk must be included in the record. Each cow must be clearly distinguished in the byre by a stall number on the wall. On the occasion of a test the cows must be milked in the same rotation evening and morning, and care must be taken that the milk of each cow for twenty-four hours, and for twenty-four hours only, is included in the test. The owner, or his agent, is required to weigh the milk of each cow evening and next morning, by means of the spring-balance and pail provided, once every twenty-one to twenty-eight days, and to enter the results and other necessary particulars in the byre sheet provided by the Association; and each byre sheet must be signed by the owner, or on his behalf, as correct in respect of all entries made. The byre sheet is sent by first post to the Superintendent, and calculated and extended by the Association's staff, and returned to the owner as soon as completed. A milk record book for each herd is written out in the Association's office. The record books are closed at the end of the recording season as at 30th November, and the results summarised and entered in special summary sheets. The record books and copies of the summary sheets, when completed and checked, are sent to the respective owners of the herds.

If must, of course, be clearly understood that the milk records compiled under this scheme are purely unofficial unauthenticated records, and have no connection with the official authenticated milk records of the Association. But from letters received and opinions expressed by members it is quite evident that very useful guidance can be obtained from the records. Several members have recommended the scheme to other farmers, or forwarded the names and addresses of likely new members.

PROSPECTS FOR 1930.

Propaganda on an extensive scale is carried through each year. Applications for membership, or for further particulars, are invited through press advertisements, articles, &c. All members of the Association, members of local milk recording societies, members under the scheme of unofficial records,

and milk recorders are requested individually to assist in obtaining new members for either scheme in their respective districts, and to send to the Superintendent the names and addresses of all local dairy farmers likely to be interested. In this way a comprehensive propaganda list of possible new members is compiled. To each address on this list are sent circular letters and propaganda literature giving particulars of both systems of recording and enumerating the advantages to be obtained, and a form of application. Following on the distribution of literature, personal visits are made to most of the farms by the Association's staff, and the herd owners are classified into groups according to the degree of probability of their becoming new members. Wherever any particular interest is shown, the visit is repeated until a definite decision is reached. By this method, continued over a number of years, dairy farmers who were formerly quite indifferent have been enrolled as new members.

Similar efforts were made to obtain additional applications for membership of local societies in 1930. With the scheme of private or unofficial milk records in operation, it was possible to carry out propaganda work for both schemes simultaneously, and nearly 2000 circular and other letters, with propaganda literature, were distributed to dairy herd owners throughout Scotland. In addition, 814 personal visits were made. But the severe depression in dairy farming which has existed for several years is evidently having a cumulative effect on herd owners, who are seeking to cut down expenditure in every possible direction; and there is the greatest difficulty in persuading them to adopt any new scheme, however promising, which entails the least additional expenditure. Yet the number of definite new applications for official records for season 1930 obtained to date is 70, 6 more than in the previous year, notwithstanding the withdrawal of the new membership grants already referred to; and a greater number than usual of prospective new members for the year following have also been obtained. If only conditions generally in the dairying industry were more normal, with better prospects for the marketing of the produce, there would be every reason to expect a considerable increase in membership of milk recording societies in the immediate future.

All the local societies of 1929 have continued in 1930, though four local societies in North Ayrshire—namely, the High Fenwick Society, the 'John Speir' Society, the Montgomerie Society, and the Stewarton & Dunlop Society,—with a view to economy and convenience in working, amalgamated to form one larger society, the North Ayrshire (John Speir) Society, employing three recorders.

The number of recorders' circuits in 1930 is 42; and the

number of herds and cows officially tested will be approximately the same as in the previous year.

The Committee are in a position to recommend a sufficient number of qualified recorders. All vacancies at the beginning of the year have been filled, and there remain a number of approved recorders on the waiting list. In this connection the Committee, as formerly, are indebted to the West of Scotland Agricultural College for giving special courses of instruction for milk recorders to meet the Association's requirements.

The Committee have arranged for supplies of sulphuric acid, amyllic alcohol, and milk-testing apparatus for local societies in 1930.

With regard to unofficial records, 120 of the 134 members of 1929 have continued in 1930, and 13 new members have been enrolled. Three of the members have been transferred to the scheme of official recording for season 1930, making a total of 33 transferred. The total membership for unofficial recording at present is 130, with approximately 2440 cows.

GENERAL REVIEW.

In Scotland systematic milk recording is now regarded by practically the whole dairying community, apart altogether from herd owners actually taking part in it, as indispensable to the country. Recorded herds are viewed by milk producers generally as a standard in milk production to which they may in due course attain, and as a necessary potential source of supply of herd bulls and high yielding cows for the improvement of ordinary commercial herds. Indeed it would be difficult for them to-day to conceive of Scottish dairying without the Scottish system of official milk recording.

But this achievement, invaluable though it is, was not the whole object of the promoters of official milk recording. In the light of subsequent experience in this and other countries it may appear that they misconceived the situation in several important aspects, but rather was it their intention that every dairy herd owner should be a member of a milk recording society and that all dairy herds should be systematically recorded.

At any rate, from this point of view the progress made in recent years in the total number of cows tested annually must seem disappointing. Taking the last eight years, from 1921 to 1929, the increase in this period was only about 13 per cent. On the other hand, for the three years immediately preceding, the increase was no less than 50 per cent. But it is significant that the last nine years have been years of acute depression in the industry, and that

the previous three years were a time of comparative prosperity. Here we have clear evidence of the very direct manner in which the general conditions of the milk-producing industry affect the progress of milk recording. And there is no doubt that the present slow progress in milk recording, so far as numbers are concerned, is directly the result of the severe depression extending over the last nine or ten years, a depression probably unparalleled in the history of Scottish dairy farming. Rather have we, in Scotland, matter for congratulation in the fact that numbers in each of these very difficult years have been more than maintained; several other countries have experienced a retrogression.

We can find encouragement also in the abundant evidence obtained in recent years that organised milk recording has a very considerable educational value among herd owners outside the movement. It is evident that an increasing number are becoming convinced of at least some of the advantages they could obtain by having their own herds recorded, and that it only requires a return of more normal conditions in the industry with better prospects for marketing for a considerable extension of milk recording. In this connection we have previously referred to the very considerable number of prospective new members who have already intimated their intention to commence official recording next year, or as soon as the conditions above-mentioned begin to show definite improvement.

More or less normal conditions in the industry appear to be the most favourable for milk recording, though why this should be so is difficult of logical explanation. An easy prosperity engenders a feeling of independence of all extraneous aids and confirms the methods and routine of former generations. On the other hand, acute depression apparently tends to produce undue discouragement, expressing itself in a desire to reduce commitments in every possible direction, and a disinclination to venture on any new scheme entailing additional expenditure.

Thus, misconceptions still prevail among a large section of milk producers as to some at least of the possibilities of milk recording. For example, there is the fairly general tendency to view official recording as of direct advantage only in pedigreed herds, to reinforce the breeding pedigree with a milking pedigree; or in already good milking herds, as a means probably of gaining wider recognition of their milking qualities and paving the way for eligibility for a herd-book. Yet milk recording was designed and introduced specifically to help dairy farmers to make the most of their herds under all conditions, and has been proved by experience to achieve this object in a marked degree when given a fair and sufficient trial.

Even among the considerable proportion of dairy farmers who properly view milk recording as primarily a means of improving milk yields, and who have only this as their main object, there are evidently many who still believe it can be of advantage to them only when there is a keen demand or a good price ruling for the produce. They reason apparently that only under such conditions is it advisable to produce good milk yields, and that only good yields are worth recording. The mere suggestion of 'surplus milk' is sufficient to drive them away from milk recording.

We have already dealt more fully in a previous review with the fallacy underlying this attitude. There can be no surplus milk production in this country, in the ordinary sense of the term, when we are still importing dairy produce to the value of over sixty million pounds annually; and there exists no reason whatever from an economic standpoint why any dairy herd owner in the country should not at all times take the fullest advantage of milk recording to improve the milking performance of his herd. On the contrary, during the period of depression and low prices for dairy produce milk recording is all the more necessary, to enable the producer to obtain an increased yield per cow and thereby lower the cost of production.

Yet in one sense of the term there is a 'surplus milk' problem, though not in the usually accepted sense. In too many herds there is too much milk produced at a loss. In other words, there are still in Scotland far too many 'passenger cows'—poor yielding cows maintained only at the expense of the high-yielding cows. It requires to be emphasised that the main object of milk recording is not necessarily to increase the total volume of milk produced in the country, or the milk yield of any herd, but to increase the yield *per cow*. A higher average yield per cow is a more profitable yield than a lower average yield per cow, under practically all conditions of dairy farming, provided the cows are fed on approved lines according to individual production; and may be obtained, and more readily obtained, without increasing the total yield.

In our opinion the most effective remedy for the present depression in the milk industry in Scotland, apart from increased consumption of milk, is to be found in milk recording and the removal from the dairy herds of a very considerable number of the poorer milkers. If the number of dairy cows in the country could be immediately reduced to the extent of, say, 15 per cent by removing the poorer milkers, several important advantages would result—a keener demand and a higher price for milk; a lower cost of production from the better class of cows remaining; smaller capital and working costs; fewer 'scrub calves' reared, &c.

But drastic selection and more successful methods of feeding can effect only some part of the improvement possible in a dairy herd ; more depends upon the inherent and hereditary milking qualities of the cows available. The most important means of all for the improvement of live stock is skilful breeding. It is upon the intelligence and skill of the breeders as such that the ultimate achievement of any breed of cattle must depend.

Breeders generally have long recognised this fact. It is safe to say that in practically every selection of a dairy herd bull the breeder has foremost in mind the effect the sire is likely to have on his daughters. But it is evident from the present low standard of the non-recorded dairy stock that in the majority of cases hopes in this direction have not been realised. Many milk-recording farmers also have met with disappointment and remain puzzled and discouraged. Within quite recent years, however, science has thrown more light on this great subject. The natural laws operating in this sphere of economics are being gradually formulated in the minds of research workers ; and it is already evident that some at least of the principles followed by the more successful breeders in the past are being confirmed, that the value of a milking pedigree will be established, and that the time is drawing near when the intelligent breeder will breed with greater confidence in the results.

The Association have been fortunate in obtaining a special article on this subject for their forthcoming Annual Report from the able pen of Mr A. D. Buchanan Smith, M.A., M.S.A., B.Sc., of the Animal Breeding Research Department, Edinburgh, from which the following observations are drawn :—

It is questionable whether the average quality of the live stock of Great Britain, with the exception of laying hens and dairy cows, has improved during the past thirty years. The reason is simple. What hens and cows produce can be measured, and where the product can be measured economic improvement can be made. Without the work of the Scottish Milk Records Association the economic quality of our dairy cows also would be no better than it was thirty years ago.

For the past eighteen months Mr Buchanan Smith, with the co-operation of a team of workers of the Animal Breeding Research Department, has been analysing the records of the Scottish Milk Records Association, the object of the investigation being to discover the mode of inheritance of milk yield, or the part played by the various ancestors of a cow in transmitting high milk production. Some general facts already stand out clear, confirming the results of other workers in America, and some general conclusions are drawn which may be helpful to the progressive breeder.

Total milk yield appears to be inherited more or less in-

dependently of butter fat. Butter fat should be estimated on a total yield basis. It is necessary to select for both total yield and total butter fat. If you breed for milk alone your butter fat yield may remain the same and the percentage go down. This is what has happened in the past.

The parents have a considerable and probably about equal influence on their daughters. But the bull, being the sire of every calf in the herd, has a more important influence, as far as the herd is concerned, than the dam. There are roughly three types of bulls. 1. Those which increase the yield of their daughters as compared with the dams of those daughters. 2. Those which have their daughters on the average no better and no worse than the dams of those daughters. 3. Those which depress the yields of their daughters as compared with the dams of those daughters. There are far more bulls in Classes 2 and 3 than in Class 1. The value of a bull in Class 1 is beyond reckoning. Hang on to such a bull. It is a pity that so many bulls of good milk pedigree are killed before their daughters have completed a lactation.

The dam is important. If she is a consistently poor yielder she should be discarded from the breeding herd. By a Class 1 bull a bad cow may produce daughters better than herself, but they have a taint in their hereditary constitution, and should not be used by a constructive breeder. No matter how good the bull may be to which she is mated, a bad cow's sons will not be good; they will belong to Class 3, bulls which depress yield.

As to the other ancestors in the pedigree, as regards milk and butter fat yield, do not go further back than the grandparents; otherwise you are apt to get misled. It is unwise also to lay much stress upon the record of the paternal grandsire, though it is well that he should be a good bull. Experience shows that the sons of a famous bull which has raised the yields of his daughters over those of their dams are, generally speaking, no better and no worse than the average bulls of the breed.

But it is quite otherwise with the record of the paternal granddam. She must give a good yield. She influences her son far more than does the bull to which she has been mated. It is of supreme importance that her yield should be well above the standard at which the breeder is aiming.

The maternal grandsire also plays a most important part in transmitting those hereditary qualities which govern milk yield. He should be out of a good dam; but more important still, he should have done well; the records of his daughters should be greater than those of their dams.

As to the maternal granddam, it is all to the good that her record should be high. At the same time it must be

recognised that if progressive breeding is taking place it should not be as good as the record of her daughter, the dam of the heifer whose pedigree is being examined.

Of other ancestors beyond the grandparents little need be said. Unless the parents and the grandparents of the heifer fill the requirements outlined, it is of little value that the great-grandparents were extraordinarily good.

In selecting a bull for a herd the emphasis should be laid as regards production on the dam.

The Milk Records Association have put into the hands of the progressive dairy breeder a great weapon by which improvement can be achieved. In the future commercial dairy herds will draw their stock from those pedigreed herds which have milk records. Buying cows in the mart without records is equivalent to buying a pig in a poke. As this fact sinks into the minds of the commercial breeders there will be an increased demand for stock with good records. A high record herd is not created in a day.

ANALYSES FOR MEMBERS DURING 1929.

By Dr J. F. TOCHER, Aberdeen, Analyst to the Society.

THE number of samples submitted for analysis during the year 1929 was 203, of which 45 were fertilisers, 34 were feeding-stuffs, 37 were milks, 52 were waters, 2 were soils, and 3 were silages. There were 17 examinations for poisons and 13 miscellaneous samples. The following table (Table I.) shows the number and nature of the samples analysed during the past six years :—

TABLE I.

	1929.	1928.	1927.	1926.	1925.	1924.
Fertilisers . . .	45	40	44	61	81	82
Feeding-stuffs . .	34	56	37	43	56	59
Waters . . .	52	50	26	26	51	35
Other samples . .	72	128	121	130	84	94
Total . . .	203	274	228	260	272	270

FERTILISERS.

General.—The fertilisers examined may be classified as follows :—

TABLE II.

Compound fertilisers	18
Potash fertilisers	6
Limes and limestones	6
Superphosphate	3
Bone meal and bone flour	3
Nitrate of soda	2
Slags . . .	2
Dissolved bone compound	2
Sulphate of ammonia .	
Phosphatic carbonate of lime	

45

The average composition of the compound fertilisers analysed during 1929 was found to be 5.76 per cent nitrogen, 6.52 per cent soluble phosphoric acid, 3.72 per cent insoluble phosphoric acid, and 7.54 per cent potash.

The nitrogen in the compound fertilisers ranged from 3.08 per cent to 8.50 per cent. The variation in soluble phosphoric acid was from 4.70 per cent to 9.77 per cent, while the pro-

portion of insoluble phosphoric acid varied from 0.80 per cent to 7.86 per cent. The proportion of potash varied from 0.12 per cent to 19 per cent.

The following table (Table III.) shows the composition of the compound fertilisers examined during the year:—

TABLE III.

	Nitrogen.	Soluble phosphoric acid.	Insoluble phosphoric acid.	Potash.
Potato manure	8.50	5.75	2.02	8.40
"	6.31	4.70	0.60	19.00
"	4.94	6.19	4.78	6.78
"	8.34	6.17	3.97	4.50
"	7.27	6.58	3.70	4.49
"	4.42	6.81	3.28	9.84
"	7.80	6.38	3.89	7.97
"	5.19	6.00	2.94	12.67
"	5.92	6.26	2.60	12.35
"	6.68	6.08	4.92	7.38
"	6.97	5.92	4.43	7.59
Turnip manure	3.08	9.77	4.17	0.70
"	3.82	6.08	7.86	0.12
Compound manure	6.63	5.82	4.96	3.64
"	4.40	7.08	2.55	12.27
"	4.28	5.34	1.98	9.55
"	3.21	8.76	4.86	2.87
"	5.96	7.74	3.18	5.67

The proportion of potash in five samples of sulphate of potash varied from 40.5 to 50.44 per cent. In connection with the origin of the potash in mixed fertilisers intended for the potato crop, some samples of commercial sulphate of potash were examined for chloride content. It was found that these contained proportions of chloride up to 5.38 per cent, expressed as potassium chloride. A sample of wood ash was found to contain just over 1 per cent of potash, together with small quantities of nitrogen and phosphoric acid. The value of the material as a fertiliser was about 9s. 7d. per ton. The samples of ground lime examined were all up to the usual guarantee within the prescribed limit of variation, and showed a marked improvement over those taken during some previous years. A sample of phosphatic carbonate of lime was found to contain 21.89 per cent of calcium phosphate and 69.85 per cent of calcium carbonate. The proportion of phosphate was well over the guarantee of 15 per cent. Two samples of waste lime examined were found to be moist mixtures of slaked lime and carbonate of lime. One contained 9 per cent of calcium hydroxide and 59 per cent of calcium carbonate, while the other contained as much as 34.56 per cent of hydroxide with 13 per cent of carbonate. Owing to the physical condition of these by-products, which are often wet and lumpy, it would not be possible to place a value on them even although unit

values were available. In many cases, however, they are at least worth the cost of carriage. The samples of bone meal, superphosphate, and sulphate of ammonia were all satisfactory. Two samples of nitrate of soda were found to contain 0.77 and 0.86 per cent of potash respectively. A sample of slag was found to be below the guarantee in phosphoric acid to the extent of 1.88 per cent.

FEEDING-STUFFS.

Thirty-four samples of feeding-stuffs were analysed during 1929, including the usual feed-cakes and such feeding-stuffs as bean meal, distillery dreg, beet pulp, oat feed, and maize meal.

The following table (Table IV.) shows the results of analyses of feeding-stuffs:—

TABLE IV.

	Oil.	Albu- minoids.	Soluble Carbo- hydrates.	Fibre.	Ash.	Moisture.
Lentil Offals . . .	1.52	17.81	49.45	14.23	5.92	11.07
Bean Meal . . .	1.15	23.88	47.53	10.24	3.76	13.44
" . . .	1.38	21.81	..	8.89	..	..
" . . .	1.11	23.69	..	9.86	..	..
Whale Meal . . .	10.74	51.50	..	..	..	7.42
Oat Feed . . .	2.20	4.40	..	25.80	..	..
Oat Husk Meal . . .	0.86	2.20	..	30.17	..	..
Oat Dust . . .	5.60	10.44	53.56	15.62	5.24	95.4
Poultry Meal . . .	5.30	16.62	54.88	5.07	8.00	10.13
Mixed Meals . . .	4.27	10.00	..	7.00	..	..
Meal . . .	17.11	22.62	37.90	5.35	7.59	9.43
Dairy Meal . . .	5.00	19.69	..	10.91	..	..
Maize Meal . . .	4.30	9.19	70.50	1.85	1.07	13.09
" . . .	4.40	9.62	71.48	1.77	1.20	11.53
Molassine Meal . . .	0.12	7.00	60.95	6.64	0.50	18.79
" . . .	0.11	7.00	63.97	7.09	7.70	14.13
Feeding Cake . . .	8.40	25.62	..	14.60	..	..
" . . .	7.66	..	..	..	..	..
Fattening Cobs . . .	8.26	18.50	..	10.17	..	..
Distillery Dreg . . .	3.56	8.79	4.01	1.12	0.34	82.18
Beet Pulp . . .	0.53	7.88	59.57	17.50	3.10	11.42
" . . .	0.57	7.88	60.85	17.17	3.17	10.36
Corn . . .	5.15	8.87	63.09	6.80	2.89	13.20
" . . .	4.97	8.94	65.76	6.23	2.95	11.15
Feeding Stuff . . .	2.01	16.19	..	7.45	..	..
" . . .	14.91	12.94	..	15.48	..	..
Turnips . . .	0.04	0.71	8.70	0.80	0.48	89.27
" . . .	0.04	0.68	9.48	0.93	0.54	88.33
" . . .	0.04	0.78	8.98	0.81	0.50	88.89
" . . .	0.04	0.78	8.45	0.76	0.59	89.38
Seaweed . . .	1.67	7.56	45.37	8.63	17.37	19.40
Bone and Meat Meal . . .	12.43	37.69	..	..	..	..

The table of feeding-stuffs for this year is an unusual one in that it does not contain a single sample of the long-established concentrate linseed cake. This feeding-stuff was, however, present as an ingredient in many of the compound feeding-stuffs submitted for analysis. A sample of lentil offals was found to contain about 6 per cent less albuminoids and

about 4 per cent more fibre than an average sample of bean meal. A sample of whale meal contained approximately the same proportion of phosphoric acid as ordinary white fish meal, rather less albuminoids, and more than double the amount of oil. A number of feeding-stuffs were examined for silica in order to trace the presence of sand and grit in the fourth stomach of cows. The highest percentage found was 0.94 in a sample of mixed cake, and the feeding-stuffs were accordingly absolved from blame. A sample of compound feeding meal was found to contain, as the principal ingredient, linseed, and to be coloured with a harmless vegetable dye. A sample of partially dried and powdered seaweed contained 1.67 per cent of ether extract and 7.5 per cent of albuminoids. Nearly 50 per cent of soluble carbohydrate was present, and only 8.6 per cent of fibre. The material could be used profitably as an addition to a ration in order to supply accessory minerals. A trace of iodine is also present in all seaweeds. A sample of distillery dreg contained over 80 per cent of moisture and only about 35 food units.

Milks.—It will be seen from the following table (Table V.) that of the 37 samples of milk examined during the year, 3 were found to be below the presumptive limit of 3 per cent butter-fat prescribed by the Department of Agriculture, 9 were below the presumptive limit of 8.5 per cent solids-not-fat, while 5 were below these limits in both constituents. The proportion of butter-fat in the 37 samples of milk varied from 2.4 per cent to 5.6 per cent, the average being 3.63 per cent. The proportion of solids-not-fat varied from 7.03 per cent to 9.46 per cent, the average being 8.6 per cent.

TABLE V.

No.	Fat, per cent.	Solids-not-fat, per cent.	No.	Fat, per cent.	Solids-not-fat, per cent.
1	2.60	8.42	20	3.50	8.96
2	3.60	8.42	21	4.20	8.86
3	2.90	8.35	22	3.10	8.55
4	5.35	7.03	23	3.40	8.78
5	5.60	8.23	24	3.35	...
6	2.80	8.57	25	2.68	8.62
7	2.64	8.05	26	3.65	8.88
8	2.40	8.10	27	4.26	...
9	3.43	7.46	28	4.30	...
10	2.90	8.35	29	4.10	8.99
11	3.60	8.45	30	4.00	9.46
12	4.40	9.14	31	4.10	8.81
13	3.00	8.48	32	3.70	8.34
14	3.20	8.40	33	3.72	8.31
15	2.95	8.94	34	3.70	8.79
16	3.45	9.05	35	3.70	8.80
17	3.60	8.94	36	3.50	9.04
18	4.30	8.89	37	4.50	9.26
19	4.30	8.77			

The following table (Table VI.) shows the nature of the distributions of butter-fat and solids-not-fat in these samples :—

TABLE VI.

Butter-fat, percentage.	Frequency.	Solids-not-fat, percentage.	Frequency.
2 to 3	9	7 to 7·5	2
3 to 4	17	7·5 to 8	...
4 to 5	9	8 to 8·5	12
5 to 6	2	8·5 to 9	15
6 to 7	...	9 to 9·5	5
	—		—
	37		34

It will be seen from the tables that one of the samples, having less than 7·5 per cent of solids-not-fat, contained 5·35 per cent of butter-fat. It is possible that this sample may have been a sample of genuine milk of abnormal quality.

Waters.—Fifty-two samples of water were analysed during the year, of which 32 were found to be suitable for domestic use. One of the samples was unfit for drinking purposes on account of the presence of an appreciable amount of lead in solution. As is usual, a few samples from hot-water systems were found to contain copper, which is the cause of the bluish discoloration of sponges, &c., in the presence of soap. Exposure to air in a sedimentation reservoir followed by filtration was recommended as a means of removing excessive quantities of iron in solution.

Examinations for Poisons.—A number of cases of poisoning of farm and domestic animals was investigated during the year. Strychnine was the cause of death in three of the cases, while in another arsenic from sheep dip was found to be present. Malnutrition appeared to be the cause of death in some cases where the presence of poisons was not established.

Miscellaneous.—A proprietary article was found to be a mixture of camphor and alcohol containing 1 per cent of methylene blue. A sample of shell sand suitable to feed to poultry as grit was found to have the following composition :—

Calcium carbonate . . .	78·3 per cent.
Magnesium carbonate . . .	6·0 „
Iron and alumina . . .	1·2 „
Calcium sulphate . . .	1·1 „
Silica . . .	1·6 „
Organic matter . . .	1·1 „
Moisture . . .	10·7 „
	—
	100·0 „

An analysis of deer bone offal, to be used as a fertiliser, was found to contain 5·5 per cent of nitrogen and 21·9 per

cent phosphoric acid, equal to 50·2 per cent of tricalcium phosphate. The value was estimated to be about £10, 12s. per ton.

The Regulations of the Fertilisers and Feeding-Staffs Act, 1926, are at present being reconsidered by the Advisory Committee, and it is likely that as a result the authorities will make a few amendments in order to secure better working of the Act.

THE CEREAL AND OTHER CROPS OF SCOTLAND FOR 1929.

THE following comparison of the cereal and other crops of 1929 with those of the previous year has been prepared by the Secretary of the Society from answers to queries sent to leading agriculturists in different parts of the country.

The queries issued by the Secretary were in the following terms:—

1. What was the quantity, per imperial acre, and quality of grain and straw, as compared with last year, of the following crops? The quantity of each crop to be stated in bushels. What quantity of seed is generally sown per acre?—(1) Wheat, (2) Barley, (3) Oats.
2. Did the harvest begin at the usual time, or did it begin before or after the usual time? and if so, how long?
3. What was the quantity, per imperial acre, and quality of the hay crop, as compared with last year, both as regards ryegrass and clover respectively? The quantity to be stated in tons and cwts.
4. Was the meadow hay crop more or less productive than last year?
5. What was the yield of the potato crop, per imperial acre, as compared with last year? The quantity to be stated in tons and cwts. Was there any disease? and if so, to what extent, and when did it commence? Were any new varieties planted, and with what result?
6. What was the weight of the turnip crop, per imperial acre, and the quality, as compared with last year? The weight of the turnip crop to be stated in tons and cwts. How did the crop braird? Was more than one sowing required? and why?
7. Were the crops injured by insects? State the kinds of insects. Was the damage greater or less than usual?
8. Were the crops injured by weeds? State the kinds of weeds. Was the damage greater or less than usual?
9. Were the pastures during the season of average growth and quality with last year?
10. How did stock thrive on them?
11. Have cattle and sheep been free from disease?
12. What was the quality of the clip of wool, and was it over or under the average?

From the answers received, the following notes and statistics have been compiled :—

EDINBURGH DISTRICT.

MID-LOTHIAN. *Wheat*—52 bushels per acre ; good crop, of very good quality ; straw 40 cwt. per acre ; 4 bushels per acre sown. *Barley*—50 bushels per acre ; samples in many cases were rather disappointing ; straw 1 ton per acre ; 3 to 4 bushels per acre sown. *Oats*—60 bushels per acre ; good crop, and yield better than for some years ; straw 30 cwt. per acre ; 4 to 6 bushels per acre sown. *Harvest*—Began about usual time. *Hay*—About 60 cwt. per acre ; of good quality, rather better than last year. *Meadow Hay*—Not much grown. *Potatoes*—Yield about 10 tons per acre ; no disease ; practically same varieties planted as usual. *Turnips*—20 to 22 tons per acre ; braided well ; some finger-and-toe disease. *Insects*—No damage from insects. *Weeds*—No damage by weeds. *Pastures*—Quite an average. *Live Stock*—Throve quite well. Cattle and sheep free from disease. *Clip of Wool*—Average.

EAST LOTHIAN (Upper District). *Wheat*—52 bushels per acre ; 40 cwt. straw per acre ; both grain and straw of the finest quality for some years ; seed sown, 4 bushels per acre drilled. *Barley*—54 bushels per acre ; straw, in some cases, 30 cwt. per acre ; above an average both in quantity of grain and straw ; quality good. *Oats*—62 bushels per acre ; 28 cwt. straw ; both a full average in quantity and quality ; straw particularly good as fodder ; seed sown, 6 bushels per acre drilled. *Harvest*—Commenced about same date as last year, and about a week earlier than in 1927 ; one of the best experienced for some years, with reduced expenses. *Hay*—50 cwt. per acre, of good quality ; weather most favourable for securing crop. *Meadow Hay*—None grown. *Potatoes*—Above an average, and free from disease ; 9 tons per acre of ware ; seed of the best quality for years ; no new varieties planted. *Turnips*—This crop was a full average ; about 20 tons per acre ; some fields suffered with mildew and finger-and-toe disease ; some partial resowing in some districts. *Insects*—No damage. *Weeds*—No loss from weeds ; weather favourable for cleaning the crops. *Pastures*—Good, with full average growth all summer. *Live Stock*—Throve well, and were more favourable as regards fattening than in past years ; all stock presented well at autumn markets. Cattle and sheep free from disease. *Clip of Wool*—A full average.

EAST LOTHIAN (Lower District). The spring weather favoured seeding, and all crops made a good start. Grain and potatoes matured into excellent crops, but September was too dry for turnips, and a widespread attack of mildew reduced excellent prospects to only a moderate yield.

Wheat—A very good crop, 44 to 54 bushels per acre, and was secured in very good condition ; seed, 3 to 3½ bushels per acre, up to 4 bushels when broadcasted. *Barley*—45 to 64 bushels per acre, and the quality was mostly up to malting standard ; seed sown, 3 to 3½ bushels per acre. *Oats*—A good standing crop, which was

got in excellent condition; yield was above average, reaching up to 80 to 90 bushels per acre or more of first-class grain; seeding, $5\frac{1}{2}$ to 6 bushels per acre, the favourite variety being Victory. Potato oats little grown in the lower district of the county. *Harvest*—Expeditious; crops secured in first-class condition early in September. *Hay*—Ryegrass and clover hay about an average; yield up to 3 tons per acre, but quality only fair in many cases, owing to unfavourable weather at haymaking time. *Meadow Hay*—None grown. *Potatoes*—Yield very good; 10 tons per acre quite common, and the tubers were sound and of good quality. *Turnips*—Practically nothing but swedes grown in the district. They commenced very well, and were very promising up to the end of August; after that a spell of dry weather brought on a general attack of mildew, with the result that the yield was no more than an average one; about 25 tons per acre. *Sugar Beet*—Very little grown. Ridge cultivation is the general practice, but a few tried sowing on the flat, with excellent results. *Insects*—Little damage done, probably less than usual. *Weeds*—Not specially troublesome. *Pastures*—Grazed very well in the early part of the season. *Live Stock*—Did well. Cattle and sheep were free from disease. *Clip of Wool*—About an average.

BORDER DISTRICT.

BERWICKSHIRE (Merse). *Wheat*—Sowings were spread out from October 1928 to the end of December. The total acreage sown was slightly less than the reduced acreage of 1928. The earlier sowings came away nicely and did well, but frost in February and vermin thinned the later sowings. The resultant crop, while well headed, was thin on the ground, adversely affecting the yield. Seeding, 3 bushels drilled or 4 bushels broadcast; natural weight 62 lb.; yield 34 to 40 bushels of good quality, well harvested; straw short and standing; 25 cwt. to the acre. *Barley*—Again a further reduction in the acreage sown of 1444 acres; braided well, and prospects in the early stages were good. Checked somewhat by drought, and laid by the storms in August. The crop was useful, and though laid was quickly and well harvested. Seeding, $2\frac{1}{2}$ to 3 bushels per acre; threshing returns were above average for quantity and of good quality, running from 4 qrs. to over 6 qrs. per acre; natural weight 53 lb.; straw 22 cwt. per acre. *Oats*—Fully 800 acres of an increase over 1928; braided well; was checked later, and never promised the usual bulk; harvest was early, and presented few difficulties; 4 to 6 bushels per acre sown, depending on variety; yield and quality above average; 48 to 56 bushels per acre, with many fields well over that; natural weight 42 lb. per bushel; straw 25 cwt. per acre of excellent quality for fodder. *Harvest*—Commenced about the middle of August, and was general by the third week; weather was excellent all the time, and a quick and early finish was made. *Hay*—Keep was short in spring, and seeds were in many cases eaten to the bone; growth was consequently retarded, and the drought in June checked a well-mixed promising crop; weather was very fine during hay harvest, practically all being secured without rain; quality very fine; bulk was greater than 1928 by 10 cwt. per acre, yield being 35 cwt. per acre. *Meadow Hay*—More bulk than last

year, but a considerable quantity was damaged more or less by the break in the weather during August; yield about 27 cwt. per acre. *Potatoes*—Total acreage 2315 acres, some 150 acres less than in 1928; never made a very great appearance above ground, but lifted a very heavy crop of sound tubers of quite 8 tons per acre; these were pitted in good condition, and kept well, though sprouting started somewhat earlier than usual. No new varieties sown, and very little spraying done; practically no disease. *Turnips*—Braided very well except for one week's sowings, which hung fire for some time; growth generally was rapid up to a point, but rain was wanting in June and July. Yellows set up and swedes mildewed; August rains set them growing again, and the open autumn added very much to the yield. Yellows 18 to 24 tons per acre; swedes 20 to 30 tons per acre. Finger-and-toe disease was prevalent, reducing the yield in many cases, but all over the crop was a big one. *Insects*—None, except a few cases of oats being grubbed. *Weeds*—Damage less than usual, as the weather was ideal for checking weeds. *Pastures*—Growth was under average until after August; all autumn pastures were rough, and permitted a big saving in the root crop; quality was good right through the season. *Live Stock*—Bare pastures in the early part of the grazing season suited sheep; these did very well, and were healthy. The fall of lambs was above average, with losses normal. Cattle did fairly well; were much disturbed in the hot weather with fly. Cattle and sheep free from disease, with the exception of an odd case of anthrax in cattle; no sheep scab. *Clip of Wool*—An absence of grease at clipping time decreased the weight of clip, which was of good quality.

BERWICKSHIRE (Lammermoor). *Wheat*—Practically none grown. *Barley*—Above an average crop of good quality grain; not much laid; yield about 5 qrs. per acre; seed sown, 3 to 3½ bushels per acre. *Oats*—Well above an average yield, grain of very good quality; yield about 6 qrs. per acre; excellent quality of straw; seed sown, 4 to 5 bushels per acre. *Harvest*—Began about a fortnight earlier than usual; weather during harvest was very good, and the work was carried through with less trouble and delay than for many years. *Hay*—Crop about an average yield of very good quality. *Meadow Hay*—Average crop, and mostly secured in good order. *Potatoes*—Well above an average; about 2 to 3 tons per acre more than last year; quality good; practically no disease; no new varieties grown in any quantity. *Turnips*—In most cases above an average yield; seed braided well; very little resowing required; finger-and-toe disease did considerable damage, and appeared to be more general than usual. *Insects*—Damage by insects less than usual. *Weeds*—Charlock still very troublesome on light land, especially in corn crop, spraying being resorted to in many cases with satisfactory results; turnip crop was fairly free from weeds; little damage done. *Pastures*—Full average growth and quality. *Live Stock*—Throve well all summer. Cattle and sheep fairly free from disease. *Clip of Wool*—Rather above the average; quantity and quality quite up to an average.

ROXBURGHSHIRE. *Wheat*—Rather more grown than in 1928; a good yield of about 48 bushels per acre, but late in ripening; the

successful crop entirely due to the dry and hot summer ; seed sown, $3\frac{1}{2}$ to 4 bushels per acre. *Barley*—A heavy crop, probably twice as large as that of last year ; abundant crop of straw ; yield 14 bags per acre ; seed sown, 3 bushels per acre. *Oats*—A very big crop ; from 14 to 20 bags per acre ; seed sown, 4 to 5 bushels per acre ; an exceptionally good corn year. *Harvest*—Commenced about the usual time. *Hay*—A good crop ; 2 tons per acre. *Meadow Hay*—A light crop in many places, but on the whole of very good quality. *Potatoes*—A bumper crop ; over 10 tons per acre ; no disease ; and no new varieties planted. *Turnips*—A varied crop, but good generally ; 20 tons per acre ; no trouble in growing, and very little resowing required. There was a considerable amount of finger-and-toe, due to the land being too frequently cropped with turnips and the want of the application of lime. Early sown turnips suffered from drought, and mildew resulted. *Insects*—No injury. *Weeds*—The crops suffered to a certain extent from weeds, but in most cases were cleaned successfully ; *Holcus* and *Lunatis* weeds, due to two crops of corn being taken off the land consecutively, which left a legacy to be dealt with in the turnip crop. *Pastures*—An exceptionally good year for grass. *Live Stock*—Both cattle and sheep did well. Cattle and sheep fairly free from disease ; Scrapie still taking a toll from ewe stock ; abortion amongst cows is widespread, and bovine tuberculosis is fairly prevalent amongst cows. *Clip of Wool*—Average clip.

SELKIRKSHIRE. *Wheat*—None grown. *Barley*—An average crop ; 36 bushels per acre ; straw 17 cwt. per acre ; seed sown, $3\frac{1}{2}$ bushels per acre. *Oats*—Good crop, very well got, with little waste ; 40 bushels per acre ; straw 1 ton per acre ; seed sown, 5 to 6 bushels per acre. *Harvest*—Began about usual time, and, with little or no rain, crops were well and cheaply secured. *Hay*—Crop similar to last year, 2 tons per acre, and secured in excellent order. *Meadow Hay*—1 ton on early meadows, well got, and of good quality ; hill hay was difficult to secure, and was a poor crop. *Potatoes*—Average yield about 6 tons per acre of fine quality ; little disease. *Turnips*—A fine crop and of good quality ; 24 tons per acre ; braided well ; very little resowing. *Insects*—None. *Weeds*—Less damage by weeds. *Pastures*—Were of average growth and quality. *Live Stock*—Throve very well. Cattle and sheep free from disease. *Clip of Wool*—Average clip of good quality.

DUMFRIES DISTRICT.

DUMFRIESSHIRE (Annandale). *Wheat*—None grown. *Barley*—Except in a few isolated cases the growing of this crop has been given up. *Oats*—Is the principle cereal crop, but owing to the high cost of production and foreign competition the acreage is yearly getting smaller. Owing to the very severe frost which continued all through February and well into March, ploughing was at a standstill, and consequently seed time was about ten days later than last year, sowing being general about the last days of March. Fine weather during April, coupled with the very beneficial effects of the long frost, enabled work on the land to be got through

very quickly and easily, and all seed was sown under ideal conditions. The braird came quickly, but, owing to the warm dry weather, the ravages of grub were very evident, and on many farms second sowing of lea had to be carried out. The season up to the middle of July was much drier and warmer than in 1928. *Harvest*—Began about the 20th August. Much of the lea crop was badly laid by the heavy rains during the latter part of July and early August. A spell of fine weather followed, and the cutting and ingathering of the crop were got through in record time; the quality of both grain and straw was much better than last year; yield 40 bushels per acre; straw 32 cwt. per acre; seed sown, 4 to 6 bushels per acre. *Hay*—Ryegrass hay was a light crop all over; average yield about 25 cwt. per acre. Owing to the very dry weather during May and part of June clovers did not do well, and the ryegrass came into ear too early, consequently a short crop was the result. The quality was good, and compared very favourably with last year. *Meadow Hay*—Quantity about the same as that of last year, and quality very good, except in some of the late districts where the heavy rains during July and August did a great deal of damage, and in many cases haymaking and harvest were being carried on at the same time. *Potatoes*—Were a very heavy crop; the acreage grown was above that of last year; yield about 8 tons per acre; disease very slight. *Turnips*—Taken all over were very good, and well up to the average, but on some farms finger-and-toe disease was very bad; brairded well, and very little second sowing was required. *Weeds*—Were not very prevalent, except for red-shank. This weed does not show up until rather late in the season, and as farmers are busy with the hay about that time many fields get rather overrun with it. *Pastures*—Growth compared favourably with last year, and stock did better, the season being much warmer and drier. *Live Stock*—Came into the market earlier, and in better condition. *Clip of Wool*—Was about an average, both as regards quality and quantity.

DUMFRIES (Nithsdale). *Wheat*—None grown. *Barley*—None grown. *Oats*—Ripened about the beginning of September; a very good crop and well got; threshed very well. *Harvest*—Began about ten days earlier than last year. *Hay*—Ultimately turned out a good crop, and got in fine order, and was better than last year. *Meadow Hay*—Much the same as last year. *Potatoes*—About 7 tons per acre; free from disease. *Turnips*—A very good crop and of fine quality; good braird; no resowing. *Insects*—None. *Weeds*—Were kept well down owing to the dry summer. *Pastures*—Very good, better than last year. *Live Stock*—Throve well. Cattle and sheep free from disease. *Clip of Wool*—A good clip, but lighter than last year.

DUMFRIES (Eskdale). *Wheat*—None grown. *Barley*—None grown. *Oats*—A very good crop, and mostly got in exceptionally good condition; threshed out very well; yield about 30 to 33 bushels per acre, and of very good quality; straw also of good quality; seed sown, about 6 bushels per acre, but 7 bushels per acre of the heavier oats. *Harvest*—Began about the usual time. *Hay*—Ryegrass only a fair crop, but quality was good; got in very good condition.

Meadow Hay—Was a light crop, got in very good condition, except a small lot wasted owing to bad weather in August. *Potatoes*—Yield very good; little disease; no new varieties planted. *Turnips*—A very good and much heavier crop than last year; braided well, and came very well to the hoe; very few second sowings required. *Insects*—No damage by insects. *Weeds*—Very little growth of weeds, as turnips were hoed dry, and weeds were easily killed. *Pastures*—About an average growth of good quality. *Live Stock*—Did very well on pastures. Cattle free from disease, but braxy was prevalent amongst hogs, and even inoculated hogs have been dying more than in former years. *Clip of Wool*—Was fully up to an average, and of very good quality.

KIRKCUDBRIGHTSHIRE. *Wheat*—None grown. *Barley*—None grown. *Oats*—Lea crops were good; grain well filled, and yield was heavy; fallow ground crops variable, but on the whole well up to an average. *Harvest*—Began about usual time, and was not protracted. *Hay*—Rotation hay a good crop, quite up to an average; weight in excess of last year; about 35 cwt. per acre. *Meadow Hay*—An average crop; less weight than last year, but got in good condition. *Potatoes*—First early varieties a very heavy crop, in some cases 11 tons per acre; with blight in third week of July, crops not lifted before then suffered much loss; late varieties also a heavy crop; yields of 10 tons per acre were common; no new varieties planted. *Turnips*—A good crop, about 20 tons per acre; braided good, with no resowing. *Insects*—None. *Weeds*—Damage from weeds not greater than usual. *Pastures*—Good all through; were luxuriant towards end of season. *Live Stock*—Throve well. Cattle and sheep free from disease.

WIGTOWNSHIRE. *Wheat*—Very little grown. *Barley*—Very little grown. *Oats*—Lea oats, 42 bushels per acre; some fields badly damaged by grub; oats, after green crop, 36 bushels per acre; well harvested except on very late farms, and where damaged by grub a bad finish in October; seeding of Potato oats, 6 bushels per acre where broadcasted, and 4½ bushels where drilled; large oats such as Victory 7 to 8 bushels per acre sown. *Harvest*—Was general in second week of September, slightly later than last year; good weather except for very late crops. *Hay*—Ryegrass hay crop very light, 25 cwt. per acre, but well got. *Meadow and Lea Hay*—A poor crop; weather not favourable for winning it; yield about 20 cwt. per acre. *Potatoes*—Early potatoes started a light crop, about 3 tons per acre, but increased later to 8 or 9 tons per acre; all earlies were Epicure seed; late potatoes were of good quality, with very little disease; yield 6 to 8 tons per acre. *Turnips*—16 tons per acre; crop braided well; very little resowing required; some fields had a considerable amount of dry-rot; not very much finger-and-toe disease. *Insects*—Damage less than usual. *Weeds*—Difficult to keep in check; docks, thistles, and redshank most prevalent. *Pastures*—Average growth and quality with last year. *Live Stock*—Throve very well. Cattle free from disease, but still some losses with lambs from dysentery and wool ball; ewes on some hill farms suffered from fluke. *Clip of Wool*—About an average.

GLASGOW DISTRICT.

AYRESHIRE. *Wheat*—46 bushels per acre; 62 lb. per bushel; straw 32 cwt. per acre; seed sown, $3\frac{1}{2}$ to 4 bushels per acre. About 100 acres of wheat grown in the county. *Barley*—39 bushels per acre; 56 lb. per bushel; straw 27 cwt. per acre; seed sown, from $3\frac{1}{2}$ to 4 bushels per acre. Under 50 acres grown in the county. *Oats*—51 bushels per acre; 40 lb. per bushel; straw 30 cwt. per acre; seed sown, $5\frac{1}{2}$ to 7 bushels per acre. *Harvest*—Began during the last week of August, and was completed by the end of the first week in October. Cereals were a good crop generally. Oats, in the later districts, were exceptionally good, and were secured in much better order than usual. *Hay*—30 to 32 cwt. per acre of good quality, and secured in good condition. *Meadow Hay*—45 to 55 cwt. per acre, secured in good order. *Potatoes*—9 tons 10 cwt. per acre. An exceptionally good crop, of good quality, practically free from blight. The market was over-stocked during the month of August, and it was with difficulty that the early crop was cleared even at very low prices. No new varieties were planted except for experimental purposes, and none of them competed with *Epicure*, which has now been grown successfully for nearly thirty years. *Turnips*—21 tons per acre. Many plots were more or less affected with finger-and-toe disease. The seed braided well, and there was little resowing. *Insects*—Insect pests were less in evidence than for many years, probably due to the keen spell of frost, which rendered the soil in fine condition for seeding. Plants braided more regularly and with greater vigour than usual. *Weeds*—Not more than usual. *Pastures*—Temperature during April was low. Grass did not come away early. Where heavily stocked, pastures were not plentiful till somewhat late in the season. *Live Stock*—Throve well on the whole, although feeding stock took longer to finish on account of the scarcity of feeding in the early part of the season. Dairy stock required more hand feeding than in an average season. Cattle and sheep practically free from disease. *Clip of Wool*—Would not be quite up to average weight, but quality was good.

BUTE. *Wheat*—None grown. *Barley*—None grown. *Oats*—A good crop, not so badly laid as usual. Good weather was experienced up to end of July, but afterwards rain was frequent. Some good weather in September, and crop was secured in fairly good order; 5 to 6 bushels per acre sown. *Harvest*—Began first week in September, about the usual time; cutting finished by 24th September, a shorter time than usual. The carting in was very protracted, finishing up at the end of October; crops which were secured early were of good quality. The cause of the long harvest was the continuous wet weather. *Hay*—About 12 tons per acre; quality, except where got in July, was poor; clover was again scarce. *Meadow Hay*—Very little grown; fair crop, but quality spoiled by wet weather; in some cases crop was entirely lost. *Potatoes*—*Epicures* are the early variety, but were not so good as last year. Digging commenced one week later than last year; yield about 6 tons per acre. The late crop (principally *Kerr's Pink*) was good; over 8 tons per acre. Difficult to get them lifted and pitted in the autumn on

account of wet weather. No disease, and no new varieties planted. *Turnips*—About the same as last year, 20 to 25 tons per acre, and of very good quality; fairly good braird, but ground was too dry for an even braird; no resowing. *Insects*—More oats than usual injured by grub. No injury to turnips by fly. *Weeds*—No injury by weeds, as they were easily killed during the very dry weather in July. *Pastures*—Were under an average, owing to weather being too dry and cold in May and June. *Live Stock*—Throve well. Cattle and sheep—no disease or epidemic of any kind. *Clip of Wool*—About an average clip.

ARRAN. *Wheat*—None grown. *Barley*—None grown. *Oats*—Crop quite up to an average, and was fairly well secured; yield about 5½ qrs. per acre, weighing from 40 to 46 lb. per bushel; quantity of seed sown, about 5 bushels per acre. *Harvest*—About the usual time. *Hay*—Average about 30 cwt. per acre, but in some cases as much as 3 tons per acre. A fair quantity of ryegrass was secured for seed purposes; many of the small farms do quite well with this crop. *Meadow Hay*—About the same as last year. *Potatoes*—About 7 tons per acre; very little, if any, disease. A considerable acreage of Arran Banner was grown, and proved a very fine crop. *Turnips*—About 20 to 25 tons; quality quite good; free from disease; no second sowing required. *Insects*—None; all the damage to crops due to vermin. *Weeds*—Crops were very clear of weeds. *Pastures*—Good. *Live Stock*—Throve well. Cattle and sheep entirely free from disease. *Clip of Wool*—About an average clip, prices being well maintained.

LANARKSHIRE (Upper Ward). *Wheat*—Only small quantities grown. *Barley*—Only small quantities grown. *Oats*—50 to 70 bushels per acre; both grain and straw of good quality, and a bumper crop. *Harvest*—Began at the usual time, and was the best experienced for many years. *Hay*—35 to 55 cwt. per acre; good quality and well got. *Meadow Hay*—Good crop and well got. *Potatoes*—A very large crop, 9 to 12 tons per acre; not much disease; no new varieties planted. *Turnips*—20 to 30 tons per acre, a little less than last year, due to wet weather and finger-and-toe disease; brairded well; very little, if any, resowing. *Insects*—Damage greater. *Weeds*—Plentiful, and were difficult to keep down, due to wet weather. *Pastures*—Were of average growth and quality. *Live Stock*—Although weather rather wet, stock did quite well. Cattle and sheep free from disease. *Clip of Wool*—Average clip, and of good quality.

LANARKSHIRE (Middle Ward). *Wheat*—30 to 40 bushels per acre; straw 30 to 40 cwt. per acre; seed sown, 4 to 4½ bushels per acre; quality of grain was very good, straw plentiful. *Barley*—None grown. *Oats*—40 to 50 bushels per acre; straw 30 cwt. per acre; seed sown, 6 to 7 bushels per acre. *Harvest*—Began about the usual time; much damage done in later districts through heavy rains. *Hay*—A medium crop, 25 to 45 cwt. per acre. *Meadow Hay*—A heavy crop, 30 to 60 cwt. per acre. *Potatoes*—A very fine crop, with very little disease; weight varied from 7 to 11 tons per acre. Prices all season very disappointing; latterly large quantities used

for cattle food, or disposed of at from 20s. to 30s. per ton. *Turnips*—A heavy crop, fairly free from disease; yield 15 to 25 tons per acre. *Insects*—Comparatively little damage by fly or soft-rot. *Weeds*—Weather conditions favoured the cleaning of the green-crop lands. *Pastures*—Fairly good returns. *Live Stock*—Was healthy. Cattle and sheep free from disease.

LANARKSHIRE (Lower Ward). *Wheat*—35 to 40 bushels per acre; quality fair, not so good as last year; straw only of fair quality, owing to crop lodging; seed sown, 3½ bushels English seed or 4 bushels Scottish. *Barley*—None grown. *Oats*—20 to 25 cwt. per acre; straw good quality; seed sown, 6½ bushels per acre of new varieties and 5 bushels of old varieties. *Harvest*—Commenced last week in August, two weeks earlier than last year. *Hay*—First cut ryegrass and clover, medium crop; 40 cwt. per acre; timothy 50 cwt. per acre; crops well got. *Meadow Hay*—None grown. *Potatoes*—Mostly main crop of Kerr's Pink variety, and a few second earlies, principally Great Scot. Yield 10 to 12 tons per acre; no disease, but some going soft in pits. *Turnips*—Fair crop, 20 to 25 tons per acre; some disease; owing to turnip fly certain areas had to be resown. *Insects*—Injury to turnip, carrot, and onion crops. *Weeds*—Not more than usual. *Pastures*—Average growth and quality; intensive manuring of grassland is being extensively practised. *Live Stock*—All classes of stock did exceptionally well during the grazing season. Sheep did not thrive so well in the late autumn owing to wet weather; nevertheless lambs on foggage have left money. Cattle and sheep were free from disease until the outbreak of foot-and-mouth disease in July. *Clip of Wool*—Average clip.

RENFREWSHIRE. *Wheat*—Much the same as last year; about 20 cwt. per acre grain, and 25 cwt. per acre straw; both grain and straw of good quality. Some damage done by severe frost, and, in consequence, resowing was required in some cases; seed sown, 3 to 4 bushels per acre. *Barley*—Very little grown. *Oats*—About 25 cwt. per acre of grain, and about 25 cwt. per acre of straw, and of good quality; seed sown, about 4 to 6 bushels per acre. *Harvest*—Began about the usual time, and, weather being favourable, was an easy one. *Hay*—Much the same as last year, about 38 cwt. per acre, of good quality. *Meadow Hay*—Very little now grown. *Potatoes*—About 8½ tons per acre; rather better than last year; quality good; no disease reported. *Turnips*—Rather better than last year; crop braided well; no resowing. *Insects*—Little or no damage. *Weeds*—No very noticeable damage. *Pastures*—Better than last year, grazed well. *Live Stock*—Did well on the pastures. Cattle and sheep on the whole free from disease. *Clip of Wool*—Quality good, and of about average weight.

ARGYLLSHIRE (Islands of Islay, Jura, and Colonsay). *Wheat*—None grown. *Barley*—None grown. *Oats*—39 to 40 bushels per acre; average weight 39 lb. per bushel. *Harvest*—An early one; began on 26th August, and finished 26th September. Except in cold high-lying parts, all crops were carted in by end of September. *Hay*—38 cwt. to 2 tons per acre, of excellent quality. *Meadow Hay*—The wet weather was against this crop. Some of the meadows

were not cut, and those which were cut in August were spoilt before the hay could be stacked. *Potatoes*—Were much above average, 6 to 7 tons per acre, and dug in good time; quality was first-class; no disease; new varieties, Arran Banner and Herald, were tried with good results; Arran Chief, British Queen, and Kerr's Pink are favourites. *Turnips*—A good crop; braided well; no second sowing required; yield about 15 tons per acre. *Insects*—No injury except that grub did a little damage to the oat braird, but this was not noticeable at harvest time. *Weeds*—The usual weeds in the potato crop—mostly chickweed. *Pastures*—Were good, both in the field and on the hill. *Live Stock*—Did uncommonly well, and were fat in August. Cattle and sheep have been free from disease. Fluke seems to be less prevalent. The dosing in winter and spring with fluke capsules seems to have checked the ravages of this disease. *Clip of Wool*—A good clip of good quality, and fully up to an average. Clip does not vary very much; a good Blackfaced stock clips on an average 4½ to 5 lb. per head.

STIRLING DISTRICT.

DUMBARTONSHIRE (Upper). *Wheat*—None grown. *Barley*—None grown. *Oats*—About 24 bushels per acre; quality good; bulk of straw rather less than last year. *Harvest*—Began about ten days before the usual time. *Hay*—Ryegrass would average about 1½ tons per acre, and the quality was good. *Meadow Hay*—Was an average crop, and, like last year, was wasted by rain; some crops were totally lost. *Potatoes*—Were a good crop, from 7 to 8 tons per acre; no disease in main crop, a little in second earlies; no new varieties planted. *Turnips*—Were rather a lighter crop than last year, about 17 tons per acre; crop braided well; no resowing required. *Insects*—No damage. *Weeds*—Were less injurious than last year, the ground being well cleaned during July; yarr got up among the oats later on. *Pastures*—Were under an average, both in quantity and quality. *Live Stock*—Did not thrive so well as usual. Cattle and sheep free from disease. *Clip of Wool*—Was rather under an average.

DUMBARTONSHIRE (Lower). *Wheat*—Was a better crop than last year, both in quantity and quality; yield would be about 36 bushels per acre at 60 lb. per bushel; 30 cwt. straw; seed sown, 3½ to 4 bushels per acre. *Barley*—Practically none grown. *Oats*—About 40 bushels per acre, of good quality; straw 22 cwt. per acre; seed sown, 5½ to 6 bushels per acre. *Harvest*—Commenced generally during the last week of August; this is about an average date, although ten days earlier than last year. *Hay*—34 to 36 cwt. per acre, of excellent quality. *Meadow Hay*—Was a fair crop; much of it was damaged by the broken weather in August. *Potatoes*—Were much above an average crop; yield 8 tons 10 cwt. per acre; very little disease. *Turnips*—Were a very good crop; yield from 16 to 20 tons per acre; crops braided well, and on the whole were free from finger-and-toe disease. *Insects*—Oats suffered in places from leatherjacket grub during the cold weather in May and June. *Weeds*—Charlock was more apparent in the oat crop than usual. *Pastures*

—Were of better quality than last year. *Live Stock*—Did not do well at the beginning of the grazing season, but thrived well from July onwards. Cattle and sheep have been free from disease. *Clip of Wool*—Rather under an average.

STIRLINGSHIRE (Western District). *Wheat*—None grown. *Barley*—None grown. *Oats*—34 to 40 bushels per acre; straw about 25 cwt. per acre; harvested in fine condition; seed about 6 bushels per acre. *Harvest*—Began about 2nd September, and finished about 10th October, ten days earlier than last year. *Hay*—30 to 40 cwt. per acre, about the same as last year; clover also similar yield to last year; secured in good condition. *Meadow Hay*—About last year's quantity; suffered from wet weather, and not well got. *Potatoes*—6 to 8 tons per acre, of good quality; no disease at lifting; kept well in pits. Some Arran Banners were grown in the district, yielding about 12 tons per acre. *Turnips*—20 to 28 tons per acre; a little finger-and-toe disease in places. *Insects*—Slight damage from fly, but not greater than last year. *Weeds*—Some damage by red-shank and yarr, but not in excess of last year. *Pastures*—Good; better than last year. *Live Stock*—Cattle and sheep thrived well. Cattle and sheep free from disease. *Clip of Wool*—Average clip and quality.

STIRLINGSHIRE (Eastern District). *Wheat*—About 50 bushels per acre of good quality; straw about 26 cwt. per acre. *Barley*—36 bushels per acre of good quality; straw 20 cwt. per acre. *Oats*—48 bushels per acre; quality good; straw 20 cwt. per acre. *Harvest*—Began about the usual time, and was a good harvest; fine weather experienced. *Hay*—A good crop, and was secured in fine condition. *Meadow Hay*—Good average crop. *Potatoes*—Above an average crop. *Turnips*—An average crop of good quality; yield about 20 tons per acre. *Insects*—Nothing unusual. *Weeds*—Injury about the usual. *Pastures*—Good. *Live Stock*—Thrived fairly well. Cattle and sheep free from disease. *Clip of Wool*—An average clip.

CLACKMANNANSHIRE. *Wheat*—A very good crop; 36 to 38 bushels per acre; straw abundant, standing well; all secured in very good condition; grain threshed well, and was in fine hard condition; seed sown, 3 to 4 bushels. *Barley*—About 34 bushels per acre; crop was abundant in straw; the grain was secured in good condition and of a fine colour; seed sown, 3 to 4 bushels per acre. *Oats*—A splendid crop got in excellent condition, threshed well; first-class quality of grain; yield 30 to 32 bushels per acre; average weight 41 to 42 lb. per bushel. *Harvest*—Began about the usual time. *Hay*—An excellent crop, 33 to 35 cwt. per acre; well got, and of very good quality. *Meadow Hay*—More productive; well got. *Potatoes*—Crop was the largest for many years; Kerr's Pink would yield from 8 to 9 tons per imperial acre; Golden Wonders 4 to 5 tons per imperial acre; quality good, and no disease; no early potatoes planted. *Turnips*—Crop was good; 27 to 28 tons per acre; braided well; no second sowing was required; a few cases of finger-and-toe disease. *Insects*—A few cases of wireworm, but damage was slight. *Weeds*—Very few; ideal weather for killing them. *Pastures*—Were more abundant, and quality much superior.

Live Stock—Throve very well, both dairy cows and feeding cattle. Cattle and sheep were free from disease. *Clip of Wool*—A fair average.

PERTH DISTRICT.

FIFESHIRE (Middle and Eastern). *Wheat*—Owing to the late sowing and severe winter frosts, this crop did not braird well, and being generally thin planted, some fields had to be ploughed up or resown with mixed grain; yield 36 to 40 bushels per acre, slightly under an average; quality of grain and straw very good; seed sown, from $3\frac{1}{2}$ to 4 bushels per acre. *Barley*—The best crop for many years, both as regards quantity and quality; yield from 46 to 56 bushels per acre, 8 to 10 bushels better than last year; natural weight well up to the standard, 56 lb. per bushel; colour and malting qualities very good; seeding from $2\frac{1}{2}$ to $3\frac{1}{2}$ bushels per acre. *Oats*—A superior crop, both as regards yield and quality; average yield from 56 to 64 bushels per acre, and in some cases from 80 to 96 bushels per acre; straw was of fine quality and well harvested; seeding from 4 to 6 bushels per acre according to variety. *Harvest*—Started generally about the last week in August, a week earlier than last year, and finished well within one month; it was carried out under ideal conditions, fine weather prevailing throughout. *Hay*—An average crop of about 2 tons per acre; excellent quality, and secured in fine condition. *Meadow Hay*—Practically none grown. *Potatoes*—A fine crop as to quantity and quality; average yield 8 to 10 tons, about 2 tons more than last year; tubers sound and free from disease; no new varieties planted. *Turnips*—Generally a good crop; about 20 to 25 tons per acre, a few tons better than last year; sound and superior feeding quality. Owing to dry weather some fields affected by mildew and canker; crop brairded well; no resowing required. *Insects*—Less damage than usual. An odd field here and there of turnips was slightly thinned out by grub or wireworm, and crows. *Weeds*—Very little damage; fine weather enabled green crops to be handled under very favourable conditions. *Pastures*—Were abundant, and of excellent quality; wild white clover did exceptionally well. *Live Stock*—All stock did exceptionally well; both cattle and sheep finished well off the grass. Cattle and sheep were mostly free from disease; fewer cases of anthrax reported. In the Cupar district grass sickness in horses was very prevalent; on some farms three and four animals were affected, in most cases proving fatal. *Clip of Wool*—Fully an average. *Sugar Beet*—The acreage grown this season was very small; average yield $7\frac{1}{2}$ tons per acre, with a sugar content of 17.1 per cent, about 1 per cent better than last year. Tonnage of washed beet much better than last two years. Growers generally were well satisfied with results, as the season was favourable for this crop.

FIFESHIRE (Western District). *Wheat*—Above the average of past few years, grain being well filled and ripened; 38 to 44 bushels per acre; straw of good quality and above the average for quantity; seed 4 bushels per acre. *Barley*—An average good crop on all classes of land, and more particularly on secondary land; 40 to 48 bushels per acre; straw likewise of good quality and average quantity;

seed $3\frac{1}{2}$ to 4 bushels per acre. *Oats*—The best crop for a number of years on all lands ; grain well matured and ripened ; 48 to 56 bushels per acre ; straw abundant and of first-class quality ; seed 5 to 6 bushels according to variety. *Harvest*—Commenced towards the latter part of August, and would be one week earlier than usual ; the work was completed without much broken time, the crops standing well to the binders. *Hay*—Ryegrass and clover hay of best quality ; average crops of 2 to $2\frac{1}{2}$ tons per acre. *Meadow Hay*—Likewise of good quality, and above an average yield. *Potatoes*—All varieties of potatoes gave heavy yields, due to the favourable season ; the crop was free from disease ; no new varieties were planted. *Turnips*—Bulked well, and the roots were sound ; being well secured, they kept well ; crop braided well, and plants easily singled ; very few cases of second sowing. *Insects*—Crops have been free from insect pests. *Weeds*—The favourable dry season kept all crops free from weeds. *Pastures*—Abundant pasture for all stock, and of good feeding value. *Live Stock*—Summered well on the pastures. Cattle and sheep generally free from disease. *Clip of Wool*—Was of fine quality, and would be of good average weight.

PERTSHIRE (Eastern District). *Wheat*—Good average crop of fine quality ; yield about 36 bushels per acre ; seed sown, 3 to 4 bushels per acre. *Barley*—A nice crop of fine quality ; yield about 40 bushels per acre ; seed sown, 3 to 4 bushels per acre. *Oats*—Good average crop ; grain and straw of excellent quality ; yield about 46 bushels per acre ; seed sown, 4 to 6 bushels per acre. *Harvest*—Commenced on 2nd September, about a week later than usual, and was practically finished by 25th September ; one of the best harvests for many years ; all grain crops secured in excellent condition. *Hay*—Not so bulky, but secured in excellent order ; yield about 30 cwt. per acre. *Meadow Hay*—Very little grown. *Potatoes*—A bumper crop ; sound and free from disease ; yield about 8 tons per acre. *Turnips*—A heavy crop in most districts, and of excellent quality ; some fields, however, were affected with finger-and-toe disease ; yield about 22 tons per acre. *Insects*—Not more than usual. *Weeds*—Not more than usual. *Pastures*—Were excellent throughout the season. *Live Stock*—Throve very well. Cattle and sheep were free from disease. *Clip of Wool*—A full average.

PERTSHIRE (Central District). *Wheat*—Fully an average break was sown ; yield about 44 bushels per acre ; straw was exceptionally good ; crop harvested in very fine condition. *Barley*—A very good crop of good quality ; yield about 37 bushels per acre, weighing from 50 to 54 lb. per bushel ; secured in very good condition. *Oats*—A bumper crop, secured in very fine condition during the end of August and early September. *Harvest*—Began about the usual time, and owing to the very fine weather no time was lost in securing the crops. *Hay*—About 45 cwt. per acre ; quality very good, both as regards ryegrass and clover. *Meadow Hay*—A very good crop, and a much better yield than last year. *Potatoes*—About 8 to 9 tons per acre ; no disease ; crop was secured in very fine condition. *Turnips*—Were very good ; yield—yellows, about 13 to 18 tons per acre ; swedes, 12 to 18 tons per acre ; finger-and-toe disease appeared on a number of farms, mostly in swede fields. *Insects*—

Turnip fly did some damage, although less than usual. *Weeds*—Thistles, coltsfoot, and charlock on many farms are on the increase. On a good many fields rushes are commencing to grow. *Pastures*—During the season were very good. *Live Stock*—As a rule, thrive very well on the pastures. Cattle and sheep were free from disease. *Clip of Wool*—An average clip.

FORFARSHIRE (Western District). *Wheat*—38 bushels per acre; grain and straw of good quality; seed sown, 3 to 4 bushels per acre. *Barley*—40 bushels per acre; grain and straw of good quality; seed sown, 3 to 4 bushels per acre. *Oats*—56 bushels per acre, of excellent quality, with good straw; a fine crop, and all well secured. *Harvest*—Began about the usual time, and finished quickly. *Hay*—Well on to 2 tons per acre, and mostly got in good condition. *Meadow Hay*—About 30 cwt. per acre. *Potatoes*—Over 8 tons per acre, of good quality; very little disease. *Turnips*—Came away well, although finger-and-toe appeared later in some fields; average yield 16 to 18 tons per acre. *Insects*—Not much damage. *Weeds*—Unless in isolated cases, did no damage. *Pastures*—Were good, especially towards the back-end of the season. *Live Stock*—Throve well. Cattle and sheep were free from disease; no epidemic. *Clip of Wool*—Clips of hill sheep slightly under an average.

ABERDEEN DISTRICT.

FORFARSHIRE (Eastern District). *Wheat*—Grain 40 bushels per acre, straw 30 cwt. per acre, both of superior quality; seed sown, 4 to 4½ bushels per acre. *Barley*—Grain 42 bushels per acre, straw 25 cwt. per acre, both of good quality; much of the barley weighed 56 to 57 lb. per bushel; seed sown, 3 to 3½ bushels per acre. *Oats*—56 bushels per acre, straw 30 cwt. per acre, very fine quality; much of the grain weighed up to 46 lb. per bushel; seed sown, 6 bushels per acre. *Harvest*—Commenced 21st August, about a week earlier than usual. *Hay*—2 tons 5 cwt. per acre, of excellent quality. *Meadow Hay*—Less productive, summer too dry for this crop. *Potatoes*—A very heavy crop, 10 to 11 tons per acre; no disease, though many potatoes were too big and overgrown and did not keep too well; no new varieties planted. *Turnips*—Good crop of 18 to 20 tons per acre; on some farms a big proportion were diseased; no trouble with the braid, and no second sowing required. *Insects*—None. *Weeds*—None. *Pastures*—Very good growth and of excellent quality. *Live Stock*—Throve well. Cattle and sheep were free from disease. *Clip of Wool*—An average clip of fair quality.

KINCAIDINESHIRE. *Wheat*—40 to 48 bushels per acre, and in a few cases from 50 to 56 bushels per acre; grain and straw of excellent quality. *Barley*—40 to 44 bushels per acre; grain and straw of first-class quality; 4 bushels per acre sown. *Oats*—Thin-skinned varieties 48 to 56 bushels per acre, and 72 to 80 bushels of thick-skinned; quality of grain and straw could not be better; 6 to 8 bushels per acre sown. *Harvest*—Began about ten days earlier than last year, and lasted about the usual time, the weather being very favourable. *Hay*—Was a much heavier crop than last year, and

secured early and in first-class condition. Yield about 50 cwt. per acre; ryegrass and clover were plentiful. *Meadow Hay*—None grown. *Potatoes*—A very heavy crop, from 30 cwt. to 2 tons per acre more than last year, average yield being about 10 tons per acre; practically no disease; few new varieties planted. *Turnips*—Yellows from 18 to 22 tons per acre, swedes 22 to 28 tons per acre; crop braided well; very little second sowing; finger-and-toe disease prevalent in some districts, but was not so bad as last year. *Insects*—Oats were injured by grub in many cases, but damage about normal. *Weeds*—None. *Pastures*—Were abundant during the season, and of very good feeding quality, due to the dry season. *Live Stock*—Throve splendidly. Cattle and sheep generally were free from disease. *Clip of Wool*—Rather under an average, but of good quality.

ABERDEENSHIRE (Buchan District). *Wheat*—None grown. *Barley*—36 bushels per acre; quality of grain and straw exceptionally good; seed sown, 4 bushels per acre. *Oats*—48 bushels per acre; quality of grain and straw exceptionally good; seed sown, 6 to 6½ bushels per acre. *Harvest*—Began about a week before usual time. *Hay*—Below average, 3 to 3½ tons per acre; quality quite good. *Meadow Hay*—None grown. *Potatoes*—About 15 tons per acre, all of excellent quality; no disease. *Turnips*—About 15 tons per acre; quality even better than last year; crop braided well; very little resowing needed. *Insects*—None. *Weeds*—None. Good spring weather helped to kill weeds. *Pastures*—A little better than average. *Live Stock*—Throve well. Cattle and sheep free from disease.

ABERDEENSHIRE (Central District). *Wheat*—None grown. *Barley*—40 bushels per acre; 3 bushels more than last year; straw 21 to 22 cwt. per acre; quality of grain much better than last year, with straw slightly better; natural bushel weight from 53 to 57 lb.; 3½ lb. better than last year; seed sown, 3 to 3½ bushels per acre where drilled, 4 bushels per acre where broadcasted or sown by hand. *Oats*—51 bushels per acre; 7 bushels more than last year; straw 23 cwt. per acre; quality of grain and straw better than last year; natural bushel weight 39 lb. to 46 lb; seed sown, Potato and all thin-husked varieties from 5 to 5½ bushels per acre where drilled, and 6 to 7 bushels per acre where broadcasted or sown by hand; for thick-husked varieties an additional 2 to 3 bushels per acre were sown. *Harvest*—Both barley and oat harvests commenced from 23rd to 30th August; with a few exceptions the barley was completed by the 9th of October, and the oats by the 23rd October. *Hay*—About 28 cwt. per acre; 3 cwt. better than last year; quality better, although not quite so well mixed with clover. *Meadow Hay*—Much about the same as last year. *Potatoes*—8 tons per acre; 10 cwt. more than last year; very little disease reported; quality very good; no new varieties planted; Majestic, Kerr's Pink, Golden Wonder, Arran Chief were the general field crops. *Turnips*—14 tons per acre; 1 ton less than last year; of very similar quality; braiding rather irregular; several second sowings reported. *Insects*—No injury. *Weeds*—No injury. *Pastures*—Average growth and quality. *Live Stock*—Throve satisfactorily. Cattle and sheep free from disease. *Clip of Wool*—About an average.

ABERDEENSHIRE (Strathbogie District). *Wheat*—None grown. *Barley*—For several seasons the weather has not suited barley, with a result that the breadth under the crop has been gradually curtailed. The past season having been favourable, crops were good, with quite a satisfactory return of grain of a desirable weight for malting purposes. Yield 36 bushels per acre; seed sown, 4 bushels per acre; weight about 56 lb. per bushel. *Oats*—A very good crop, and generally secured in satisfactory condition. The harvest was of short duration owing to the favourable weather. Yield about 40 bushels per acre; weight 41 to 43 lb. per bushel; straw plentiful and of good quality; seed sown, 6 bushels per acre. *Harvest*—Began about the usual time, a fortnight earlier than last year. A month would be about time taken up with the work of cutting and securing the crop. *Hay*—Not much grown; there is now little market for hay, and the acreage saved for this crop is being curtailed. *Meadow Hay*—None grown. *Potatoes*—Were good. Farmers in this district do not grow the tuber for sale, and consequently do not suffer from a slump in prices. Yield 5½ tons per acre; no new varieties planted; Kerr's Pink at present holds the field; quality of tubers quite good, much better than in recent years. *Turnips*—Have done well; roots plentiful for stock all through the season; no resowing; plants progressed nicely to the singling stage, and grew all right during the season. *Insects*—None of the crops suffered injury from any kind of insects. *Weeds*—Did not cause much trouble, the weather being favourable for keeping the land clean. *Pastures*—Were abundant during the whole of the season, and stock did well on the fields. The nature of the pasture is being changed, as farmers are sowing much less ryegrass, relying more on the natural grasses, such as cocksfoot, timothy, and rough-stalked meadow. Cattle and sheep free from disease. *Clip of Wool*—Was of an average quantity and of good quality.

BANFFSHIRE (Upper District). *Wheat*—None grown. *Barley*—Only a limited area sown; what was grown turned out well; 5 to 6 qrs. an acre, and well ripened. *Oats*—A good crop, abundant both in straw and grain; on good soils as much as 7 qrs. an acre, which is an exceptional yield in the uplands. *Harvest*—Cultivation was well forward in spring, and a favourable seed-time let the crop start early; however, the months of May and June were cold, and grub damage was serious; several fields had to be resown; August and September made good, and harvest came on in fairly good time, and weather held good until all was reaped. *Hay*—Crop suffered from the backward May and June months, and did not fill out to an average; was secured in good order; from 100 to 150 stones per acre. *Meadow Hay*—Meadows are pastured when the sown grasses get bare. *Potatoes*—Only planted for home consumption; a very fine crop of 7 to 10 tons per acre; Kerr's Pink is the leading variety. *Turnips*—Started well and only one sowing; scarcely a full average; in wet soils portions of the crop soured a good deal. *Insects*—Damage only by grub in the oat crop. *Weeds*—It was difficult to get drill harrowing or skimming done among the turnips owing to wet, and weeds prevailed for a time. *Pastures*—Were stocked too early owing to the previous turnip crop being destroyed by frosts; the grazing season proved a most unremunerative one for graziers. *Live Stock*—

Cattle were high in price at going out and low when coming in. Cattle and sheep quite healthy; some few cases of grass disease in horses. *Clip of Wool*—Was an average. Sheep continue to be the sheet anchor of farming; farms are being put down to pasture in undue haste.

INVERNESS DISTRICT.

NAIRNSHIRE. *Wheat*—None grown. *Barley*—Varied from $4\frac{1}{2}$ to 6 qrs. per acre, of excellent quality; straw bulky; seed sown, 4 bushels per acre. *Oats*—7 to 10 qrs. per acre; straw plentiful; seed sown, about 6 bushels per acre. *Harvest*—Began about the usual time. *Hay*—Scarcely so good as last year; yield about $1\frac{1}{2}$ tons per acre. *Meadow Hay*—None grown. *Potatoes*—A very good crop, heavier than last year; no disease. *Turnips*—A good yield of yellows, but swedes were hardly so good as last year; second sowings were required on many farms. *Insects*—No injury. *Weeds*—No injury. *Pastures*—Suffered to some extent from dry weather, grazing being rather scarce. *Live Stock*—Throve well. Cattle and sheep free from disease. *Clip of Wool*—An average clip.

INVERNESS-SHIRE (Skye). *Wheat*—None grown. *Barley*—None grown. *Oats*—An inferior crop; grain and straw did not ripen well on account of unfavourable weather. *Harvest*—Began about a week later, commencing about 16th September. *Hay*—Ryegrass and clovers an average crop, mostly secured in good time; clovers do not grow well except in a few favoured places. *Meadow Hay*—A good enough crop, but could not be secured on account of the wet weather, a large portion of it being lost altogether, and some fields were never cut. *Potatoes*—A fair crop, but many of the tubers rotted in the ground before they could be lifted. *Turnips*—An average crop; yield, except where grown on flat and soft ground, was poor; braided well; no second sowing necessary. *Insects*—No appreciable damage. *Weeds*—Were more plentiful than usual, especially in potato and turnip crops. *Pastures*—Quite good during whole of season. *Live Stock*—Throve well during summer, but on account of the very wet weather in the autumn they did not put on much flesh. Cattle and sheep free from disease. *Clip of Wool*—An average clip.

ROSS-SHIRE (Dingwall and Munlochy). *Wheat*—Very little grown; yield 34 to 40 bushels per acre; seed sown, 3 to 4 bushels per acre. *Barley*—Still a smaller acreage grown; yield 30 to 38 bushels per acre; seed sown, 4 to 5 bushels per acre; average quantity and quality of straw; grain finer quality than that of late years. *Oats*—44 to 80 bushels per acre; seed sown, 6 to 8 bushels per acre; finest quality of grain and straw. *Harvest*—Began about the usual date, and was finished in good time. As the crops were standing, and the weather being good, with drying winds, crops were easily handled. *Hay*—1 to $1\frac{1}{2}$ tons per acre, of very fine quality. *Meadow Hay*—None grown. *Potatoes*—About 5 to 8 tons per acre; not quite so heavy as last year; finest quality; very little disease. *Turnips*—Swedes gave a good yield, 15 to 25 tons per acre; yellows

15 to 20 tons per acre ; in some places there was a lot of rot among yellows ; crop braided well ; very little second sowing. *Insects*—Crops not injured. *Weeds*—No injury to crops. *Pastures*—Average growth and quality. *Live Stock*—Throve well. Cattle and sheep free from disease. *Clip of Wool*—Up to an average, and of good quality.

ROSS-SHIRE (Tain, Cromarty, and Invergordon). *Wheat*—About 36 bushels per acre ; 2 bushels better than last year ; quality good ; straw about normal ; seed sown, 4 bushels per acre. *Barley*—About 38 bushels per acre ; 2 bushels better than last year ; quality and colour good ; straw about normal ; seed sown, 4 bushels per acre. *Oats*—Average crop, about 50 bushels per acre ; 2 bushels better than previous year ; quality of grain and straw good ; seed sown, 4 to 6 bushels per acre according to variety. *Harvest*—Started about 1st September, about a week before the usual time. *Hay*—Was a light crop, averaging 26 cwt. per acre ; quality was very good ; secured in splendid order. *Meadow Hay*—None grown. *Potatoes*—Average crop, about 8 tons per acre ; 1 ton per acre more than last year ; practically no disease ; a few Arran Banner were grown, and they gave a big yield. *Turnips*—Average crop of swedes, about 28 tons per acre ; 3 tons better than last year ; yellows 25 tons per acre, also 3 tons better than last year ; crop braided well ; no resowing. *Insects*—No damage. *Weeds*—Very little damage ; charcoal, as usual, was bad in parts. *Pastures*—Good. *Live Stock*—Throve well. Cattle and sheep free from disease. *Clip of Wool*—Average weight and quality.

CAITHNESS-SHIRE. *Wheat*—None grown. *Barley*—Very good crop, above an average ; 36 bushels per acre and over ; seed 4 bushels per acre. *Oats*—Suit the soil and climate ; there was an extra good appearance of this crop during the first weeks of September ; it was then well filled and regularly ripe, except in places where it was so heavy that it got 'lodged' ; this frequently happens where there has been a luxuriant growth of wild white clover when the field was under grass ; 4 to 6 bushels usual seeding. *Harvest*—Was general by the second week of September, and the ground was in good trim, but on the 21st there came a hurricane which gave a 'shake' to the ripe corn, and twisted the straw in all directions ; this was followed by rains driven by very high winds for weeks ; the ground got sodden, and the uncut fields and the stooks became damaged ; 'stook drill' and field screws became the only resource for saving a proportion of a high-quality crop. *Hay*—A good crop, which was got in good condition where cut early ; later the season was not so favourable ; the clover in foggage came on very well. *Meadow Hay*—That early cut had the best weather ; there was an average yield. *Potatoes*—A large crop of all the varieties ; fully 8 tons would be an average ; this is better than last or most years ; the lifting had to be done at intervals between rains, with the ground very wet in October and November ; disease was not prevalent ; rooks make havoc among the early kinds. *Turnips*—Braided well ; there was no second sowing ; yield about 16 tons of swedes and over 20 of yellows when sown before the middle of June ; those sown later met a very unfavourable bulbing time at the back end ; those sown

too early shot up into seed. *Insects*—There was no great attack of grub; some fields might be thinned where late ploughed; the ravages are generally seen in extending spots. *Weeds*—Thistles and sow thistles are persistent; skellock prevails among the turnips, and coltsfoot (locally called Doo dockens) continue to spread. *Pastures*, with increasing acreage, provided good food for sheep and cattle; wild white clover grows naturally, and generally has a place in the seed mixture sown. *Live Stock*—Came on very well, but the prices got for prime quality cattle were disappointing. There has been no outbreak of foot-and-mouth in the north for generations; tuberculosis and sheep scab are being brought under control, and anthrax is very rare; grass sickness is suspected in some cases of sudden death of horses. *Clip of Wool*—Good quality, and up to the average in yield, though the price is getting lower.

SHETLAND. *Wheat*—None grown. *Bere*—38 bushels per acre; 17 cwt. straw; bushel weight, 52 lb.; seed sown, $4\frac{1}{2}$ bushels per acre; quality of grain and straw good. *Oats*—40 bushels per acre; 14 cwt. straw; bushel weight, 42 lb.; quality of grain and straw very good. *Harvest*—Commenced about a week earlier than last year, but crops had to remain in stook for many weeks owing to very wet weather, but were then secured in good order. *Hay*—Owing to the very dry weather in spring and early part of summer the crop was very light, 19 cwt. per acre. *Meadow Hay*—Also suffered from the drought in spring. Most of it late in being cut, and, due to the wet weather which came later, much of it was destroyed. *Potatoes*—Crop was the best for many years; yield 10 tons per acre, of good quality; no disease, and no new varieties planted. *Turnips*—Also a good crop; 15 tons per acre; only one sowing was required; very little finger-and-toe disease reported. *Insects*—No damage. *Weeds*—Crops clear of weeds other than charlock, which is very common in many districts. *Pastures*—During spring and first part of summer were bare, owing to continual dry weather. Later on, in July, grass came away, quality of which was good. *Live Stock*—Did very well on pastures during the latter part of the season. Cattle and sheep free from disease. *Clip of Wool*—About an average, both in weight and quality.

THE WEATHER OF SCOTLAND IN 1929.

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THIS report consists of (1) a general description of the weather from month to month, and (2) a selection of rainfall returns in which each county of Scotland is represented by one or more stations. It is to be noted that all the temperature readings referred to are, unless otherwise stated, from the thermometers exposed in the regulation "Stevenson Screen."

JANUARY.

Through the persistence of anticyclonic conditions, the weather was quiet, free from gales, and the mean barometric pressure was well above the average. At Aberdeen the mean pressure at 7 A.M. was the highest since 1866.

Temperatures were generally low, and at Renfrew during the first four days the thermometer kept throughout below 32° F., while at Braemar on the morning of the 4th it went as low as 3° F. Short mild intervals were centred around the 9th, 19th, and 30th, but on the whole it was the coldest January since 1897. The six previous Januaries were each mild.

In every district the rainfall was remarkably low, the deficiency being very pronounced in northern and north-western areas. The 9th was wet, particularly in the south and west, but most of the rain fell during the last three days of the month. In coastal districts adjoining the Moray Firth it was locally the driest month since 1866, and at Ardrross Castle it was the driest January since at least 1870.

Snow was frequent, but falls were on the whole slight; the largest falls occurred about the 9th, and between the 15th and 17th, when in north-east counties the falls ranged up to 12 inches. Owing to the melting of snow on the high ground flooding occurred locally on the 29th, chiefly in eastern and southern counties.

Under the quiet conditions fog was frequent and often widespread, being reported from the Glasgow area on twenty-one days and from Perth on seventeen days. Sunshine aggregates were, with the exception of the extreme northern and north-western areas, below the average. There was a complete absence of thunderstorms.

FEBRUARY.

The mild unsettled weather at the end of January continued into February. However, by the 11th, anticyclonic conditions became established, and on this date cold south-easterly winds of Siberian origin swept the country, reaching gale force in many districts. The winds moderated, but the anticyclonic conditions, apart from a mild unsettled spell between the 19th and 22nd, continued throughout the month. Gales occurred in the Shetlands and extreme northern districts on the 15th and 16th.

Since the memorable great frost of February 1895 this month was the coldest, except perhaps in extreme northern districts, the mean temperature being much below the average. The frost, both day and night, was exceptionally severe between the 11th and 19th, most rivers and lakes being covered with ice, and domestic water supplies seriously interrupted. On the 16th the thermometer went to 0° F. at Wolfelee, to 5° F. at Kettins, and to 6° F. at North Berwick.

Precipitation was, apart from a small area around the Tay estuary, below normal, it being the driest February in some northern districts for at least fifty years.

Snow fell frequently and on an unusually large number of days between the 9th and the end of the month. On the 11th and 12th falls were large, and in the south-west, especially in Wigtownshire, on account of the drifting caused by the gales, many roads and some railways were blocked; somewhat similar conditions prevailed at the time in the Banff and Moray areas. Further heavy falls and drifting occurred on the 15th and 16th, chiefly in north-eastern counties and in the Orkneys and Shetlands, the undrifted snow lying locally over one foot deep. Again on the 26th many roads were snow-blocked in central and eastern districts.

In west and central areas fog was very prevalent, being reported in particular at Greenock on sixteen days, including every day from 12th to 22nd. In the east the occurrences were limited to a few night fogs.

Sunshine aggregates varied very irregularly, and in the main were somewhat below normal. Aurora was observed on several nights, the display on the 27th being visible from the north of Shetland to as far south as Devon. As in January there were no thunderstorms.

MARCH.

For the third month in succession anticyclonic conditions were predominant, this being particularly so from about 3rd

till 19th and from 27th to 30th; in the remaining periods depressions passing to the northward caused some slight increase in the westerly wind circulation over Scotland. The mean barometric pressure was well above the normal and the highest for March since at least 1856. On the 1st and 31st the wind reached gale force at a few places along our north and west coasts.

The mean temperature for the month, in contrast with that of the previous two months, was above normal, the day temperatures being much above the average. A noteworthy feature was the enormous daily range of temperature, particularly between the 11th and 14th, the range in places reaching or exceeding 40 degrees. There was a slight cold spell from the 13th to the 16th, but on the 27th temperatures soared in several districts to the 70° level; on that day 71° F. was recorded at Gordon Castle, the highest reached in March in Scotland since 1894.

The month was exceedingly dry, the first nineteen days being practically rainless; from the 20th to the 23rd there were scattered showers, then mostly dry again until the 31st, on which day rain fell in most areas. In the Dee valley, Strath Tay, the Lothians, and Border counties there were twenty-seven days without rain, while in Edinburgh during the last 150 years only on four occasions has March been so dry—namely, in 1781, 1809, 1847, and 1850. Generally the rainfall amounts were less than 25 per cent of the average, while around Aberdeen they were as low as 10 per cent.

Again under the quiet conditions fog was prevalent, occurring at Glasgow on twenty days, at Greenock on eighteen, and at Stirling on twelve days.

Sunshine totals were exceptionally large, as many as 191 hours of bright sunshine being enjoyed at Inverness, and over 180 hours in many other areas.

Thunder was reported from several places on the 22nd, this being the first occasion this year. Aurora was observed on twelve nights, that on the night of 12th being visible over most of the northern and western counties.

APRIL.

During the first few days the weather was of a rather cold unsettled type, but with considerable bright periods, particularly in the north and west. An improvement set in about the 5th, and mainly fair conditions prevailed during the next ten days. The latter half of the month was cold, with mainly northerly to north-easterly winds, and over eastern districts snow at times. The mildest periods were experienced around the 9th and from the 16th to 18th. The winds reached gale

force locally in the southern half of the country on the 1st and 18th, and in the Shetlands on the 19th, 20th, and 22nd. For the fourth month in succession the mean barometric pressure was above the normal.

Over Mid and East Lothain, in Banffshire and in Aberdeenshire, rainfall was above the average, but elsewhere there was a deficiency, this being locally in the south-west as much as 50 per cent. In the west, most of the month's rain fell between the 16th and 19th. Slight snow fell on the Grampians and in Inverness-shire on the 1st and on the Lammermuirs on the 2nd; rather heavier amounts were experienced between the 24th and 28th, particularly in East Lothain, Perthshire, Speyside, and in Orkney.

The month was very sunny in the west, particularly in the Western Isles, but elsewhere sunshine aggregates differed little from normal.

Fog was less prevalent than during the previous three months, and was mostly confined to the Clyde area.

Thunder occurred locally on eight days.

MAY.

Depressions moving north-eastwards across the country gave cold unsettled weather during the first fortnight; from the 15th to the 21st there was a general improvement; conditions then once more deteriorated, but improved again towards the end of the month. The mean barometric pressure was for the first time this year below the normal. Gales occurred locally between the 7th and 10th.

At the beginning of the month temperatures were low, the first being very cold; the mean temperature was, however, slightly above normal, this being largely due to a warm spell centred about the 27th, when day temperatures locally exceeded 75° F.

The rainfall was deficient in northern, north-eastern, and south-eastern counties, but elsewhere generally exceeded the normal. The largest falls of rain occurred on the 6th and 22nd, on the former date falls of over an inch occurring locally in northern districts. From the 10th to 13th heavy rain fell in the Loch Lomond and Loch Fyne districts. Sleet showers occurred locally during the first four days.

Thunder was reported on fourteen days; on the 4th, 8th, and 15th thunderstorms were widespread in the eastern half of the country, and again on the 22nd, but this time they were mostly confined to the western half.

There was some local fog, but this, as in April, was mainly confined to the Clyde area.

The month was very sunny in the west, north, and south-east; elsewhere sunshine aggregates approximated to normal.

JUNE.

Disturbed weather characterised the first three weeks of the month, but during the last ten days mainly fair weather was experienced.

On the 1st temperatures were rather high locally, but from the 2nd to 10th it was cold. Warm spells occurred about the 11th to 12th, 17th to 19th, and 26th to 27th. The mean temperature was, however, subnormal.

Rainfall in the west and north was above the average, but over most of the eastern counties, particularly those in the Border district, it was generally below normal. Previous to the last week of the month, which was almost rainless, rain fell somewhere on most days, although amounts were on the whole not large. Heavy falls occurred locally on the 1st, 2nd, 18th, and 19th. During the first ten days hail and sleet showers were rather widespread.

Gales were reported between the 16th and the 24th, while thunderstorms occurred in many districts, chiefly between the 5th and 8th and the 10th and 14th.

Fog, in contrast with the previous five months of the year, was absent from the Clyde, but it was present on two occasions in the Forth estuary.

In the northern half of the country there was a deficiency of sunshine, but in the south there was an excess. The month ended with almost a week of bright sunshine, the 25th, 26th, and 27th being exceptionally fine.

JULY.

Weather during the first ten days of the month, apart from a brief fine period centred about the 7th, was of an unsettled type, heavy rains associated with local squalls being common. During the period temperatures were rather low for the time of year, but after the 11th, with rapidly improving conditions, temperatures became high in all but extreme northern districts. The warmest spell occurred about the centre of the month, when on the 15th and 16th 83° F. was reached at Ruthwell, 82° F. on the 15th at Glenbranter and on the 16th at Renfrew. About the end of the month conditions became once more unsettled, and temperature fluctuated about normal.

Much of the rainfall was associated with thunderstorms, and as a result there were some heavy falls locally; at Greenock a noteworthy fall of 3.03 inches, most of this falling between 1 P.M. on the 4th and 1 A.M. on the 5th, gave rise to flooding. In Central Scotland and in the neighbourhood of the Border,

rainfall was above the average, while northwards of Inverness and in the Lothian district it was deficient. In many districts little or no rain fell between the 12th and 26th.

Thunder was reported on nine days, the thunderstorms of the 4th, 5th, and 31st being rather severe in south-eastern districts, whilst that of the 17th was particularly destructive in Orkney. Fog was reported locally on twelve days, but sunshine was generally, with the exception of the north-west, above the July average.

AUGUST.

Throughout most of the month depression after depression swept eastwards or north-eastwards across the country and maintained an unsettled type of weather with rather low day temperatures and frequent heavy rains, these often being associated with thunderstorms. The mean temperature, however, differed little from the normal, but this was due to the mild nights rather than warm days, the day and night temperatures often being about equal.

Rainfall was mainly above the average, the excess being greatest in northern, western, and southern districts. Between the eastern slopes of the Grampians and the east coast from the Moray Firth to the Firth of Tay there was a deficiency, this being particularly so in the valleys of the Dee and Don. The rainy days were numerous, and in many north-western and western areas there were only two dry days.

Gales occurred locally on several occasions, while towards the end of the month fog was reported from many places. Thunderstorms were rather frequent and widespread, few parts of the country escaping. Sunshine aggregates were generally low, only a small area in the Border districts enjoying more than average figures.

SEPTEMBER.

After a rather stormy beginning the weather became over most of the country brilliantly fine and warm; these conditions persisted, apart from a short break about the 19th, until the 28th, when they rapidly deteriorated. Both the mean barometric pressure and the temperature were above the normal.

The warmest spell was between the 7th and 11th, when temperatures above 70° F. were reported from wide areas; on the 8th at Aberdeen the high figure of 79° F. was reached. It was one of the warmest Septembers for over thirty years.

The extreme northern and north-western districts did not experience the bright conditions, many places north of the

Caledonian Canal having a large excess of rain; in parts of Skye and Ross-shire rain fell on every day but one. In the south and east the month was one of the driest on record, the total rainfall over large stretches of country in these areas being less than a quarter of an inch.

Gales occurred extensively on the 1st, 21st, and 28th, and locally on the 2nd, 19th, 20th, and 29th. During the quiet weather fog was rather prevalent, being reported from the Clyde area on as many as ten days. Very local thunderstorms were experienced on three days.

A large excess of sunshine was enjoyed in the south and east, while in the north and north-west there was as great a deficiency.

OCTOBER.

The frequent passage of depressions across the British Isles caused October to be, particularly in north-western and western districts, very unsettled with frequent heavy rains and strong winds, gales being reported on fourteen days, those of the 2nd, 3rd, and 10th occurring over wide areas. There was a brief spell of mainly fair weather between the 10th and 15th, and again during the last two days of the month.

Temperature on the whole differed little from normal; there was a mild spell about the centre of the month, but the last week was rather cold, severe night frosts being experienced locally.

Rainfall over most of the country exceeded the average October amount; the areas with a deficiency were confined chiefly to the Dee valley in Aberdeenshire and to south-eastern counties. In the north and west there were numerous heavy daily falls; at Glenquoich, for instance, there were eight days with over 1 inch, on four of which there were more than 2 inches and on one 3 inches.

Snow, sleet, or hail fell on fifteen days, the hill-tops near Coldstream, on Deeside, at Carrbridge, and on Loch Lomond-side receiving a coating of snow during the first two or three days of the month, while later in the month, particularly on the 25th, the snow was more widespread.

Thunder occurred extensively between the 2nd and 7th, and locally on 10th, 24th, 25th, and 27th.

Fog was reported on ten days, but sunshine totals were usually about normal.

NOVEMBER.

Apart from a brief fair spell about the centre of the month, the weather was very disturbed, frequent heavy rains being

experienced, particularly in southern districts, and winds often reaching or approaching gale force. Gales were reported on sixteen days.

Temperatures differed little from normal, while rainfall was in general above the average. Over the counties of Moray, Nairn, Banff, and Aberdeenshire there was a decided deficiency of rain, while in parts of Ross, Inverness, and Sutherland it was only slightly less so. There were very few dry days, the driest period occurring between the 14th and 17th. Locally on the 4th there were some heavy falls, on this day at Ardgour and Glencroe each had more than 3 inches.

Thunderstorms were reported between the 5th and 8th and on a few other days; that on the 6th was severe over southern Scotland, while that on the 8th did considerable damage in the Aberlour district.

Fog was rather frequent about the centre of the month, and again towards the end, it being on the latter occasion rather dense along the south-eastern coast.

Although the weather was disturbed, sunshine aggregates were about average, a slight excess being frequent in northern districts.

DECEMBER.

Weather during December was somewhat similar to that of the previous month; it was, apart from a fair period about the centre, very unsettled, with much rain and strong winds, gales occurring somewhere or another on each day excepting the 15th, 16th, 17th, and 31st. The mean barometric pressure was decidedly subnormal.

The month was on the whole mild, the mean temperature being well above normal. It was, however, very wet, only a few places in coastal districts along the Cromarty Firth reporting less than the average rainfall, while in many parts the rainfall was more than twice the normal, many areas experiencing floods. There were many large daily falls, falls of over an inch being experienced at individual places on as many as nine or ten occasions.

Precipitation of a wintry type was frequent between the 7th and 11th, and from the 18th until the end of the month, the falls of snow being heavy locally on the 20th.

Although the weather was so disturbed, local fog was rather frequent, but sunshine aggregates were good, particularly in eastern districts.

Thunderstorms were reported, mostly from western and north-western districts, on nine days, those of 9th being rather severe.

GENERAL NOTE.

Perhaps the most notable features of the year 1929 were (1) the cold spell, with very severe frosts, experienced during the first months, and the mildness of the last two months ; (2) the relatively mild and sunny March, following on the cold spell, with a very large daily temperature range, and also the very warm and generally fine September ; (3) the approximation of the annual rainfall to normal, although the totals in most districts for the first nine months were on the average less than the totals for the remaining three months ; (4) the mildness and wetness of December, being in parts the wettest December on record, at Rothesay the wettest since at least 1800 ; (5) the stormy nature of the three closing months of the year ; (6) the little difference in annual values for barometric pressure, temperature, and sunshine from normals in a year which provided so many extremes and records.

RAINFALL RECORDS FOR 1929, IN INCHES.

	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
Shetland—Lerwick	2.67	1.96	1.20	1.48	1.88	2.17	1.18	4.51	4.26	8.70	7.89	8.13
Orkney—Kirkwall	1.41	2.01	.96	1.91	1.66	2.88	1.15	5.05	5.57	7.16	4.77	6.69
Caithness—Wick	1.28	.67	.88	1.69	1.94	3.81	1.31	4.79	3.52	4.41	3.20	5.61
Sutherland—Tongue	2.08	.91	.58	2.14	2.34	3.75	1.78	5.08	4.77	7.04	3.21	6.20
Lairg	1.26	.74	1.59	2.16	2.07	2.64	1.45	4.95	3.75	4.78	3.55	6.74
Ross and Cromarty—												
Portrose	.64	.27	.43	1.16	1.76	1.52	1.96	3.36	1.76	3.09	1.62	2.11
Ardrass Castle	.99	.65	.61	1.89	2.08	1.68	2.39	5.18	2.89	4.87	3.38	4.05
Lochcarron	1.58	1.41	2.44	4.40	3.61	5.14	5.80	8.17	8.30	14.93	6.86	10.64
Stornoway	1.85	1.44	1.23	1.59	2.22	3.26	2.91	5.84	6.19	7.61	5.86	7.69
Inverness—Inverness	.43	.35	.25	1.08	1.49	1.80	2.86	3.04	1.48	3.56	2.54	2.70
Kingussie	.68	.81	.46	1.66	1.56	1.70	3.03	3.12	1.66	4.89	3.71	5.55
Fort-William	1.99	2.10	1.83	3.52	5.38	4.64	5.90	8.93	5.09	19.97	10.10	16.26
Glenquoich	3.18	2.94	3.96	6.08	5.68	7.41	6.61	11.29	10.07	23.84	14.20	22.78
Portree	2.50	1.60	1.64	2.08	3.49	4.07	5.53	7.59	7.71	12.81	8.94	10.69
Nairn—Nairn (Dolnie)	.30	.42	.33	1.48	2.62	1.76	2.15	3.98	1.79	3.41	1.35	2.02
Moray—Gordon Castle	1.19	.72	.25	1.82	1.34	2.41	1.06	2.74	1.50	3.49	1.88	3.91
Grantown	1.34	.35	.24	2.58	2.66	2.05	4.03	4.27	1.37	4.30	1.41	2.65
Banff—Banff	1.22	1.50	.56	2.17	.98	2.48	1.64	3.72	1.37	3.66	2.41	6.51
Aberdeen—Fyvie Castle	3.01	3.20	.39	2.09	1.99	2.61	2.51	3.88	1.76	4.41	2.79	7.57
Peterhead	3.04	1.73	.42	2.26	1.32	2.18	2.57	3.78	1.77	3.63	2.78	5.96
Aberdeen (King's Coll.)	1.54	1.72	.22	1.75	2.28	1.84	3.80	2.80	1.28	3.20	3.55	6.54
Balmoral	1.24	1.10	.23	1.85	2.02	1.57	4.58	2.32	1.01	3.15	3.22	7.05
Kincardine—												
Balmakewan	1.81	3.11	.13	1.22	2.27	1.74	3.09	4.92	.51	2.77	3.95	6.68
Angus—Moutrou	1.29	2.20	.19	1.09	2.03	1.40	2.93	4.07	.37	2.61	3.59	4.38
Dundee (E. Necropolis)	1.25	1.92	.42	1.15	2.39	1.96	3.49	3.29	.65	2.56	3.78	3.63
Glamis Castle	1.51	1.01	.41	.79	2.17	1.58	2.36	3.49	.37	3.28	3.43	6.01
Brechin	1.85	3.27	.11	1.75	2.34	1.70	3.31	4.70	.50	2.82	4.36	7.37
Perth—Blair Castle	1.36	1.75	.66	1.41	2.58	1.55	2.30	3.12	1.28	4.17	3.61	9.03
Orfry	1.79	2.81	.67	.99	2.70	2.08	3.47	6.37	.82	5.37	5.44	6.85
Perth	.97	1.48	.61	.87	2.35	1.44	3.54	3.02	.40	3.61	3.22	4.06
Fife—Cupar	1.41	2.11	.48	1.35	2.41	1.71	2.71	3.67	.45	2.64	4.06	4.31
Kirkcaldy	1.10	1.45	.39	1.47	2.38	1.24	2.53	4.29	.48	2.88	3.88	3.35
Kinross—Loch Leven	1.20	2.05	.53	1.39	2.43	1.77	3.49	4.54	.44	3.75	5.50	4.56
Clackmannan—												
Tillicoultry	1.91	1.88	.65	1.16	2.59	2.29	3.03	5.60	1.06	3.82	5.27	5.98
Argyll—Gruin (Mull)	2.83	2.86	1.63	3.18	7.08	4.06	5.63	7.66	4.45	11.37	10.10	16.49
Oban	2.55	2.20	1.62	2.74	4.44	3.99	4.98	5.89	3.48	8.95	7.04	12.05
Glenorchy Manac.	2.77	2.32	1.73	3.31	4.68	5.45	4.58	8.60	5.47	13.05	10.61	19.59
Inveraray	2.84	2.32	2.36	3.68	5.07	6.32	7.55	9.76	4.27	12.65	12.67	17.50
Campbeltown	3.61	4.27	1.24	1.26	4.72	3.04	3.24	5.83	2.10	6.22	8.05	13.08
Bute—Rothesay	2.63	3.59	1.67	1.46	3.68	3.55	4.49	7.49	2.24	7.66	7.79	11.17
Stirling—Stirling	1.54	1.57	.45	.65	2.52	1.74	2.59	4.78	.81	4.41	5.91	7.13
Dumbarton—Arrochar	3.07	2.88	2.02	2.17	8.11	5.87	6.83	9.12	4.13	11.50	11.35	21.95
Helensburgh	2.40	2.82	1.73	1.47	3.59	3.17	4.94	6.73	1.78	7.40	7.51	13.12
Renfrew—Greenock	2.90	2.77	1.47	1.26	5.25	3.99	6.41	6.90	1.86	8.78	10.47	15.58
Paisley	2.18	2.34	.88	1.03	3.07	2.67	2.83	5.75	1.16	6.32	7.42	10.14
Ayr—Kilmarnock	1.68	2.16	1.22	1.25	2.92	3.26	4.10	6.37	1.70	5.08	6.36	8.40
Ayr	1.16	2.15	.90	1.33	2.49	3.32	4.45	5.81	1.22	5.73	5.13	8.46
Murkirk	1.46	1.84	.88	1.82	3.31	2.61	4.96	6.34	2.02	7.27	7.82	13.80
Pinnore	2.20	2.65	1.13	1.38	1.43	3.21	3.06	5.53	1.46	6.51	7.45	11.61
Lanark—												
Glasgow (University)	1.36	1.67	.81	.97	2.46	2.73	2.50	5.74	1.16	4.68	6.21	8.54
Biggar	.94	1.59	.52	1.43	1.51	1.86	3.78	4.82	.81	3.99	4.85	7.20
Lesmahagow	.94	1.49	.71	1.52	2.79	2.13	3.72	5.82	.88	5.18	5.72	9.26
Linlithgow—												
Bangour	.91	1.17	.52	2.03	1.79	2.42	3.08	4.66	.85	3.50	4.04	4.59
Mid-Lothian—												
Edinburgh (University)	.81	.85	.20	1.59	1.34	2.49	2.22	3.72	.35	3.04	3.60	3.33
Gorebridge (Deanbank)	1.19	1.03	.33	1.68	1.78	2.30	3.58	4.18	.20	2.73	3.11	3.23
Ovenford Castle	.45	.87	.93	1.60	1.04	2.42	2.13	3.67	.22	2.06	2.32	4.17
Haddington—												
North Berwick	.90	1.24	.34	1.91	2.05	1.93	2.46	4.43	.28	2.25	2.42	2.37
Stobshiels Reservoir	1.06	.60	.28	1.98	2.63	3.31	2.28	5.46	.29	3.39	3.80	4.50
Berwick—Dune Castle	2.54	1.79	.13	1.67	1.49	2.19	4.04	4.52	.28	2.95	3.27	3.92
Coldstream (The Hut)	1.17	1.13	.03	1.42	.97	1.82	2.12	5.17	.17	2.54	2.22	2.50
Peebles—West Linton	1.08	1.23	.65	1.21	1.58	2.72	4.11	4.90	.91	4.56	4.96	6.56
Seikirk—Galashiels	1.00	1.44	1.18	1.35	1.23	1.56	2.63	3.93	.19	2.70	3.21	5.23
Roxburgh—												
Branksome	1.03	1.36	.46	1.51	2.28	2.03	3.94	4.95	.50	3.66	5.26	7.81
Kelso (Broomlands)	1.33	1.12	.18	1.27	.78	2.75	3.18	3.71	.37	2.45	2.28	3.65
Dumfries—Dumfries	1.79	1.12	.77	1.11	3.25	1.95	4.57	4.72	.39	5.19	6.43	7.19
Carsalloch	1.86	1.48	.92	1.20	2.91	2.18	4.31	5.31	.40	5.42	6.74	7.91
Castlemilk	2.15	1.53	1.15	1.68	3.45	1.38	5.86	7.55	.59	5.47	7.76	7.08
Langholm	2.76	1.86	1.46	1.49	2.73	3.30	6.39	8.48	.60	7.14	8.23	10.49
Kirkcudbright—												
Dalbeattie (Kirkennan)	3.81	2.20	1.14	1.61	4.07	3.13	5.46	7.27	.75	9.29	9.23	11.06
Oargon	1.92	1.54	1.07	1.73	3.82	2.90	5.56	6.24	.76	6.43	8.33	8.96
Carsphairn (Shiel)	3.37	3.67	1.46	2.06	6.38	3.62	5.32	8.27	1.48	10.26	14.68	19.34
Wigtown—Monroith	2.88	2.74	1.14	.91	3.22	1.94	3.53	5.53	.74	6.65	6.36	7.77

AGRICULTURAL STATISTICS.—RETURNED UPON 4TH JUNE 1929—(Compiled from the Government Returns).

TABLE No 1.—ACREAGE UNDER CROPS AND GRASS IN EACH COUNTY OF SCOTLAND.

COUNTIES	CORN CROPS										Other Crops																						
	Wheat		Barley		Malting Barley		Oats		Mixed Grain		Rye		Beans		Potatoes		Turnips and Swedes		Manuldy		Sugar Beet		Cabbage		Rape.		Vegetables & (Potatoes)		Small Fruit		Rye Grasses and Clover.		Other Crops
	Acres	Acres	Acres	Acres	Acres	Acres	Acres	Acres	Acres	Acres	Acres	Acres	Acres	Acres	Acres	Acres	Acres	Acres	Acres	Acres	Acres	Acres	Acres	Acres	Acres	Acres	Acres	Acres	Acres	Acres	Acres	Acres	
1 Aberdeen	622,069	2,672	4,111	10	17	17	17	21	24	51	77,907	1,759	6	2	154	115	9	2,207	256	293,869	202												
2 Angus	243,711	213	24	30	17	10	71	23	20	14	28,740	10	53	200	100	200	100	471	1,846	68,600	126												
3 Argyll	116,830	1,062	17	10	10	14	14	14	14	14	6,874	15,06	305	12	30	184	12	131	11	27,202	26												
4 Argyll	30,584	126	17	10	10	14	14	14	14	14	6,874	15,06	305	12	30	184	12	131	11	27,202	26												
5 Argyll	156,713	144	184	12	12	6,116	44	410	4	22	20	6	50,390	1,875	1	6	70	14	577	72,639	18												
6 Berwick	158,555	124	17	10	10	14	14	14	14	14	6,874	15,06	305	12	30	184	12	131	11	27,202	26												
7 Bute	24,489	1,062	17	10	10	14	14	14	14	14	6,874	15,06	305	12	30	184	12	131	11	27,202	26												
8 Clackmannan	105,939	74,783	23,866	3	4	20,677	27	6	1	3	2,185	1,852	10,343	2	15	48	4	184	1	40,916	60												
9 Clackmannan	15,245	7,133	8,073	12	8	2,637	2	161	1	3	3,011	372	704	1	45	90	1	143	83	2,680	2												
10 Dundee	242,631	121	141	121	457	3	33,777	20	85	1	6,493	2,109	1,811	10	45	90	1	143	83	2,680	2												
11 Dundee	108,646	81,144	27,502	4,36	11,942	15,065	6	72	171	32,016	8,473	11,814	843	64	836	305	4	75	67	68,497	105												
12 East Lothian	285,220	158,774	7,446	11,237	9,2	42,711	82	550	209	14	64,701	16,576	20,102	2	370	138	61	54	249	25,784	129												
13 Fife	148,593	58,315	64,675	3	3,560	2,15	49	762	1	4	34,778	4,555	8,472	2	50	23	10	253	14	35,698	113												
14 Inverness	117,400	108,731	11	39	5,85	31	84	1	10	4	37,635	4,154	14,555	3	11	68	11	85	59	48,788	42												
15 Kilmarnock	38,668	20,823	12,830	104	110	6,224	1	21	1	1	13,306	1,307	2,159	21	52	646	107	30	10,769	31													
16 Kirkcaldy	180,853	110,770	10,668	18	27	19,2	14	22	40	7	36,226	6,122	9,030	15	448	605	5	368	1,306	68,864	509												
17 Leith	239,633	110,770	10,668	18	27	19,2	14	22	40	7	36,226	6,122	9,030	15	448	605	5	368	1,306	68,864	509												
18 Mid Lothian	116,716	72,686	44,524	4	83	2,976	11,855	1	6	7	27,232	6,122	9,030	15	448	605	5	368	1,306	68,864	509												
19 Moray	70,066	8,661	9,406	6	1	7,78	24,06	13	215	22	32,716	1,704	19,774	23	11	23	45	354	24	40,882	19												
20 Nairn	107,123	61	92	16,855	3	3,917	20,406	15	15	2	8,246	1,7	3,578	2	2	6	2	53	24	40,882	9												
21 Orkney	20,991	20	91	16,855	3	3,917	20,406	15	15	2	8,246	1,7	3,578	2	2	6	2	53	24	40,882	9												
22 Peebles	331,220	91,444	109,775	6,800	1,661	68,525	1	343	552	4	78,338	18,210	22,17	6	34	124	750	1,077	3,149	91,552	6												
23 Perth	80,411	30,550	50,191	1,800	1	8,576	1	33	33	2	10,262	3,222	1,558	5	110	15	2	56	112	14,572	119												
24 Ross & Cromarty	15,716	108,812	29,404	985	5,46	32,47	2	1	0	0	7,171	19,187	4	445	104	48	43	183	24	58,211	27												
25 Shetland	174,371	10,000	69,371	804	9,10	21,2	1	0	0	0	28,766	1,318	12,735	15	4	0	0	6	6	58,086	21												
26 Shetland	30,045	14,620	16,073	141	3,104	8,245	1	1	1	1	3,845	1,384	2	2	0	0	0	15	6	8,772	2												
27 Shetland	22,441	12,624	13,171	516	5,952	1	1	1	1	1	3,845	1,384	2	2	0	0	0	15	6	8,772	2												
28 Shetland	110,837	48,906	62	41	314	16,514	84	111	236	3	19,237	3,292	3,41	4	0	0	0	638	162	20,510	30												
29 Shetland	90,804	21	4	9,870	100	6,794	1	1	1	1	6,901	1,028	2,465	1	0	0	0	24	2	10,772	2												
30 Shetland	54,548	31,536	23,212	2,805	1,033	10,186	42	13	10	20	18,58	3,018	20	21	307	1	1	33	41	11,970	17												
31 Wigtown	154,82	98,374	5,651	4	23,446	1	1	1	1	1	24,617	1,574	10,855	183	56	172	1	1	33	60,669	41												
TOTAL	4	110,549	558,31	11,0	28,83	337	1,047,232	114	0	371	273	1204	613	4132	8520	121	10,480	7027	1,490,36	3181													

AGRICULTURAL STATISTICS.

TABLE No. 2.—TOTAL PRODUCE OF WHEAT, BARLEY, AND OATS, AVERAGE AND YIELD per Acre in the Year 1929, compared with the YIELD for the Year 1928, and the AVERAGE of the Ten Years, 1919-1928, in each County of Scotland.

COUNTIES.	WHEAT.										BARLEY, INCLUDING BEER.											
	Total Produce in 1929.					Yield per acre. 1929.					Total Produce in 1929.					Yield per acre. 1929.						
	Average in 1929.					Average of the Ten Years, 1919-1928.					Average in 1929.					Average of the Ten Years, 1919-1928.						
Qrs.	Tons.	Acres.	Bush.	Cwt.	Bush.	Cwt.	Bush.	Cwt.	Acres.	Tons.	Qrs.	Bush.	Cwt.	Bush.	Cwt.	Acres.	Tons.	Qrs.	Bush.	Cwt.	Bush.	Cwt.
Aberdeen	40	8	8	29.6	16.1	37.3	19.8	32.0	17.6	32.0	43,000	8,540	9,580	36.1	17.9	34.5	16.6	32.0	32.0	34.5	16.6	32.0
Angus	51,000	11,000	10,787	35.0	20.8	34.8	19.1	35.5	17.6	35.5	57,600	11,000	10,967	41.8	20.4	37.3	17.6	35.5	35.5	37.3	17.6	35.5
Argyll	3,900	870	674	45.5	25.7	47.1	26.0	45.5	18.1	45.5	3,200	610	771	33.7	18.9	33.8	16.8	36.8	36.8	35.3	16.8	36.8
Ayr	8,000	1,800	1,604	39.7	21.9	41.6	22.9	39.1	18.1	39.1	30,000	6,000	6,168	38.7	18.3	35.5	16.5	37.2	37.2	35.5	16.5	37.2
Barr	15	3	3	40.0	21.4	40.0	21.5	34.5	18.1	34.5	53,000	9,500	10,397	40.1	18.5	34.8	17.2	34.5	34.5	18.7	34.5	34.5
Bute	900	200	162	44.7	25.1	43.3	24.1	39.0	18.0	39.0	2,200	400	455	39.0	17.0	39.3	17.8	39.6	39.6	17.8	39.6	39.6
Caithness	1,900	340	314	41.0	21.9	37.8	20.2	36.9	17.4	36.9	460	90	88	41.7	20.8	40.5	19.9	36.9	36.9	19.9	36.9	36.9
Clackmannan	29,000	6,400	4,726	48.2	27.1	42.5	23.8	43.4	18.0	43.4	180	30	39	53.0	17.0	33.7	15.5	37.7	37.7	15.5	37.7	37.7
Dumfries	59,000	13,000	11,237	41.7	23.3	37.3	20.4	36.0	18.0	36.0	79,000	16,000	11,945	53.0	16.8	34.2	15.4	45.4	45.4	16.8	34.2	45.4
East Lothian	170	40	33	41.4	22.6	40.1	21.5	39.1	18.1	39.1	59,000	12,000	9,892	47.9	23.3	41.8	19.1	39.5	39.5	23.3	41.8	39.5
Fife	4,300	970	868	39.9	22.4	37.2	20.9	35.8	18.0	35.8	26,000	5,000	5,358	38.5	18.5	36.2	18.3	36.1	36.1	18.5	36.2	36.1
Kinross	940	210	194	38.6	20.8	38.5	19.8	36.2	18.0	36.2	550	110	110	39.7	19.5	38.8	18.2	34.6	34.6	19.5	38.8	34.6
Kirkcubright	8,300	1,800	1,750	38.7	20.8	38.5	20.5	35.3	18.0	35.3	180	30	41	34.4	16.2	32.1	14.7	32.6	32.6	16.2	32.1	32.6
Leith	29,000	6,500	4,783	42.7	23.4	43.6	24.5	43.8	18.0	43.8	38,000	7,600	7,765	49.8	19.3	43.8	18.9	38.5	38.5	19.3	43.8	38.5
Mid-Lothian	3,400	770	661	41.4	23.3	37.3	20.4	36.1	18.0	36.1	7,200	1,400	1,705	34.0	16.5	33.7	15.8	30.7	30.7	16.5	33.7	30.7
Moray	10	2	2	40.0	21.4	40.0	21.5	34.5	18.0	34.5	16,000	2,700	3,397	36.5	16.9	34.3	16.6	32.6	32.6	16.9	34.3	32.6
Nairn	10	2	2	40.0	21.4	40.0	21.5	34.5	18.0	34.5	190	40	53	45.1	22.1	36.8	17.6	32.6	32.6	22.1	36.8	32.6
Orkney	10	2	2	40.0	21.4	40.0	21.5	34.5	18.0	34.5	8,000	1,500	1,631	38.9	18.7	37.4	17.5	35.7	35.7	18.7	37.4	35.7
Peebles	32,000	7,000	6,800	38.1	20.5	36.4	19.5	37.5	18.0	37.5	23,000	4,000	4,458	33.8	14.9	34.1	15.0	33.9	33.9	14.9	34.1	33.9
Perth	7,600	1,600	1,556	40.0	21.4	40.0	21.5	34.5	18.0	34.5	6,700	1,200	1,410	40.7	20.3	34.3	17.1	34.6	34.6	20.3	34.3	34.6
Ross and Cromarty	2,800	630	555	43.3	23.6	42.5	23.0	41.6	18.0	41.6	33,000	6,000	6,910	45.1	18.5	35.4	18.1	33.9	33.9	18.5	35.4	33.9
South Ayr	3,800	880	804	38.2	21.1	39.6	22.3	38.0	18.0	38.0	7,200	1,400	1,705	34.0	16.5	33.7	15.8	30.7	30.7	16.5	33.7	30.7
Selkirk	10	2	2	40.0	21.4	40.0	21.5	34.5	18.0	34.5	2,100	360	516	32.8	13.8	33.0	15.2	32.0	32.0	13.8	33.0	32.0
Shetland	4,500	1,000	1,091	33.4	18.8	31.6	17.7	37.3	18.0	37.3	1,300	280	314	33.7	15.9	33.3	16.6	34.7	34.7	15.9	33.3	34.7
Stirling	13,000	2,900	2,308	45.2	25.2	45.0	25.2	44.4	18.0	44.4	6,500	1,300	1,399	37.7	18.3	37.9	18.6	35.8	35.8	18.3	37.9	35.8
Sutherland	10	2	2	40.0	21.4	40.0	21.5	34.5	18.0	34.5	2,100	360	516	32.8	13.8	33.0	15.2	32.0	32.0	13.8	33.0	32.0
West Lothian	10	2	2	40.0	21.4	40.0	21.5	34.5	18.0	34.5	2,100	360	516	32.8	13.8	33.0	15.2	32.0	32.0	13.8	33.0	32.0
Wigtown	10	2	2	40.0	21.4	40.0	21.5	34.5	18.0	34.5	2,100	360	516	32.8	13.8	33.0	15.2	32.0	32.0	13.8	33.0	32.0
Total all Scotland	293,455	57,933	50,780	41.5	22.0	38.7	21.2	38.5	18.0	38.5	521,250	101,435	100,549	41.5	20.1	38.1	18.4	36.5	36.5	20.1	38.1	36.5

TABLE NO. 2—continued.

TOTAL PRODUCE OF WHEAT, BARLEY, AND OATS, ACREAGE and YIELD per Acre in the Year 1929, compared with the YIELD for the Year 1928, and the AVERAGE of the Ten Years, 1919-1928, in each COUNTY OF SCOTLAND.

COUNTIES.	OATS.							
	Total Produce in 1929.		Acreage in 1929.	Yield per acre.				Average of the Ten Years, 1919-1928.
				1929.		1928.		
	Grs.	Tons.	Acres.	Bush.	Cwt.	Bush.	Cwt.	Bush.
Aberdeen	986,000	150,000	179,080	41.1	16.7	41.1	15.2	36.0
Angus	396,000	61,000	56,795	55.8	21.3	51.4	18.8	47.1
Argyll	71,000	10,000	14,767	38.2	18.6	38.2	18.8	36.4
Ayr	227,000	33,000	35,834	50.8	18.2	49.9	17.9	46.2
Banff	245,000	38,000	44,410	44.1	17.0	44.4	16.3	42.6
Berwick	143,000	21,000	26,146	43.6	16.2	40.1	14.8	38.6
Bute	23,000	3,300	4,240	43.2	15.7	43.0	15.6	41.6
Caithness	125,000	18,000	26,677	37.6	18.2	37.8	18.3	33.6
Clackmannan	16,000	2,300	2,657	47.6	17.7	54.7	20.5	42.1
Dumbarton	33,000	4,700	0,176	43.1	15.2	40.7	14.6	41.4
Dumfries	187,000	28,000	33,507	44.7	16.7	40.7	15.3	38.4
East Lothian	118,000	18,000	15,086	62.4	23.8	68.1	22.1	53.2
Fife	297,000	45,000	42,717	55.7	21.8	49.9	18.7	45.7
Inverness	118,000	17,000	29,715	81.8	11.2	81.5	10.5	28.2
Kincardine	198,000	30,000	31,374	50.4	19.1	46.9	17.7	43.7
Kilross	36,000	5,200	6,224	46.1	16.8	45.5	16.6	40.4
Kirkcudbright	94,000	13,000	19,258	39.0	13.8	38.1	13.5	34.0
Lanark	166,000	24,000	34,333	38.7	13.0	41.6	14.9	43.4
Mid-Lothian	139,000	21,000	19,359	57.6	21.6	53.2	20.0	47.5
Moray	131,000	20,000	24,009	43.6	16.6	42.7	16.3	42.0
Nairn	34,000	5,100	6,503	42.0	15.9	39.8	14.4	33.5
Orkney	143,000	20,000	30,406	37.7	13.2	39.8	13.8	32.9
Peebles	31,000	4,500	5,353	46.7	17.1	43.8	16.0	37.2
Perth	385,000	57,000	63,825	48.3	17.7	45.0	16.6	43.9
Renfrew	46,000	6,800	8,826	42.0	15.3	42.7	16.2	40.7
Ross and Cromarty	159,000	23,000	32,473	39.0	14.2	41.6	15.0	40.1
Roxburgh	130,000	20,000	21,982	47.2	18.2	43.3	16.1	37.3
Selkirk	17,000	2,600	3,103	42.7	16.5	36.7	13.3	31.7
Shetland	23,000	3,300	5,952	30.8	11.2	28.8	8.5	25.0
Stirling	105,000	16,000	16,514	51.0	19.5	50.3	19.4	46.5
Sutherland	32,000	4,600	6,794	37.3	13.7	37.5	13.9	33.9
West Lothian	74,000	11,000	10,185	57.8	21.8	55.8	20.6	51.6
Wigtown	130,000	19,000	24,446	42.6	16.0	46.6	17.5	37.5
Total all Scotland	5,058,000	755,400	888,731	45.5	17.0	43.7	16.0	40.1

TABLE No. 4.—TOTAL PRODUCE OF TURNIPS (including SWEDEN) and MANGOLDS, AVERAGE and YIELD per Acre in the Year 1929, compared with the YIELD for the Years 1928 and 1927, and the AVERAGE of the Ten Years, 1919-1928, in each COUNTY of SCOTLAND.

COUNTIES.	TURNIPS AND SWEDEN.										MANGOLDS.			
	Total Produce in 1929.	Acres in 1929.	Yield per Acre.			Average of the Ten Years, 1919-1928.	Total Produce in 1929.	Acres in 1929.	Yield per Acre.			Average of the Ten Years, 1919-1928.		
			1929.	1928.	1927.				1929.	1928.	1927.			
Aberdeen	Tons. 1,211,000	Acres. 77,306	Tons. 15.7	Tons. 16.5	Tons. 14.8	Tons. 16.3	Tons. 80	6	Tons. 13.0	Tons. 13.6	Tons. 8.0	Tons. 13.48		
Angus	580,000	28,745	18.4	17.6	16.4	18.4	190	10	18.5	17.0	16.9	15.7		
Argyll	79,000	4,644	17.0	16.6	15.5	15.0	130	12	11.2	14.0	12.4	12.2		
Ayr	141,000	6,727	21.0	20.1	16.8	18.6	4,500	197	22.8	19.5	19.3	19.4		
Banff	309,000	18,675	16.5	16.7	16.8	16.4	16.4	16.4	16.4	16.4	16.4	16.4		
Berwick	359,000	18,466	19.4	20.1	16.9	19.4	2,500	127	19.8	14.5	15.8	16.7		
Bute	20,000	1,210	16.8	16.1	18.2	15.1	30	2	16.8	15.7	18.0	14.5†		
Caitness	201,000	10,243	19.6	21.3	16.5	18.9	18.9	18.9	18.9	18.9	18.9	18.9		
Clackmannan	11,000	704	15.3	18.2	14.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6		
Dumbaraton	24,000	1,811	18.2	15.4	14.8	18.5	170	10	17.2	13.7	12.4	20.8		
Dumfries	263,000	13,812	19.1	19.0	15.2	18.2	1,700	110	15.3	13.3	16.4	17.0		
East Lothian	11,814	29.2	20.6	20.6	20.5	19.5	7,400	343	21.5	19.7	20.7	19.9		
Fife	399,000	20,102	19.8	19.6	17.2	18.7	600	28	21.3	20.4	16.8	17.0		
Inverness	131,000	9,472	14.8	13.8	11.4	13.5	16.0	16.0	16.0	16.0	16.0	16.0		
Kinross	314,000	14,655	21.4	21.5	21.6	17.5	16.0	16.0	16.0	16.0	16.0	16.0		
Kirkcubright	32,000	2,159	15.0	16.0	16.2	17.5	390	21	18.6	19.3	13.6	16.3		
Leven	133,000	8,343	18.3	17.4	11.5	16.3	15	15	19.0	17.1	17.4	15.2		
Lincoln	190,000	8,980	21.3	19.5	15.7	19.1	290	15	18.0	20.0	20.3	20.9		
Mid Lothian	177,000	8,924	19.9	18.8	18.5	18.0	770	32	24.2	18.9	15.5	15.7		
Moray	219,000	12,774	17.1	17.5	16.2	16.7	430	23	18.0	16.8	16.8	16.8		
Nairn	52,000	3,578	14.4	14.1	11.2	13.4	16.0	16.0	16.0	16.0	16.0	16.0		
Orkney	150,000	12,457	12.1	12.1	11.7	10.1	16.0	16.0	16.0	16.0	16.0	16.0		
Peebles	51,000	2,467	20.7	18.9	19.1	18.4	16.0	16.0	16.0	16.0	16.0	16.0		
Perth	392,000	22,177	17.7	17.9	13.8	17.3	60	6	11.8	15.4	13.7	15.1		
Renfrew	96,000	1,858	19.3	18.1	13.3	18.0	100	5	20.0	19.6	15.1	19.4		
Ross and Cromarty	231,000	18,187	16.8	16.7	16.9	16.5	60	4	14.0	13.0	15.0	16.2		
Roxburgh	270,000	15,098	17.9	15.4	14.6	15.6	900	45	19.9	12.0	9.6	12.7		
Selkirk	31,000	1,784	17.5	14.6	15.4	16.7	30	2	16.8	10.0	12.0	14.9†		
Shetland	11,000	981	11.3	12.5	13.3	12.6	16.0	16.0	16.0	16.0	16.0	16.0		
Stirling	88,000	9,447	23.9	26.7	19.2	21.9	90	4	21.7	24.5	19.8	22.3		
Sutherland	2,465	18.1	17.6	16.7	16.7	15.1	16.0	16.0	16.0	16.0	16.0	16.0		
West Lothian	59,000	3,018	19.7	18.9	18.8	19.8	4,000	20	20.1	16.4	20.0	22.7		
Wigtown	154,000	10,735	17.1	16.4	15.1	15.5	4,000	183	21.8	12.9	18.7	15.1		
Total	6,606,000	371,273	17.8	17.6	15.8	17.0	24,820	1,204	20.6	17.3	18.1	17.8		

* Average of 6 years only. † Average of 5 years only. ‡ Average of 9 years only. § Average of 8 years only.

TABLE NO. 5.—TOTAL PRODUCE OF HAY FROM RYE-GRASS AND OTHER ROTATION GRASSES AND CLOVER, also Total from Permanent Grasses, Acreage, and Yield per Acre in the Year 1929, compared with the YIELD for the Years 1928 and 1927, and the AVERAGE of the Ten Years, 1919-1928, in each COUNTY OF SCOTLAND.

COUNTIES.	FROM RYE-GRASS AND OTHER ROTATION GRASSES AND CLOVER.						FROM PERMANENT GRASS.					
	Total Produce in 1929.			Yield per Acre.			Average of the Ten Years, 1919-1928.			Yield per Acre.		
	Tons.	Acre.	Cwt.	1929.	1928.	1927.	Tons.	Acre.	Cwt.	1929.	1928.	1927.
Aberdeen	66,000	51,827	25.7	24.4	26.3	27.7	1,909	1,735	31.8	19.7	19.7	20.2
Angus	44,000	23,425	37.3	37.5	37.7	36.8	2,830	1,406	33.0	33.0	33.0	28.8
Aberdeen	19,000	11,592	32.3	30.7	29.8	29.1	18,830	1,964	42.4	28.6	30.6	29.1
Ayr	42,000	26,697	31.7	29.8	32.8	31.9	46,000	23,120	42.1	42.1	40.6	40.3
Banff	16,000	10,425	20.4	28.4	29.0	29.0	410	238	22.7	21.9	20.1	21.2
Berwick	23,000	13,221	26.0	25.3	23.8	21.8	3,510	2,543	27.5	22.4	24.7	24.2
Bute	4,000	2,334	34.0	34.6	36.1	37.0	860	860	37.5	33.0	33.0	33.8
Caithness	8,800	9,908	17.3	17.2	20.1	18.0	294	294	33.1	23.0	23.0	23.8
Clackmannan	5,100	1,212	52.4	47.0	40.9	40.7	9,520	1,723	58.0	7.9	8.3	8.0
Dumfries	9,800	5,015	38.4	35.6	36.2	35.1	4,900	1,805	38.7	47.7	44.2	43.9
Dumfries	34,000	20,228	33.0	29.0	32.3	29.1	28,100	12,062	38.7	37.7	37.0	33.2
East Lothian	23,000	9,120	50.4	49.3	47.9	46.0	2,260	1,483	31.6	28.1	29.6	27.9
Fife	57,000	25,645	44.3	41.9	39.2	38.8	8,500	1,684	31.7	31.0	35.8	34.5
Inverness	14,000	11,918	23.7	22.2	22.4	21.8	9,306	5,700	21.3	17.7	18.6	19.5
Kincardine	22,000	13,054	34.3	32.6	32.5	34.6	370	291	32.5	25.9	25.8	30.9
Kirkcubright	6,800	2,017	43.5	42.6	38.6	37.2	950	558	35.1	38.9	30.6	35.8
Kirkcubright	15,000	11,170	27.0	24.8	28.1	25.6	18,900	14,558	35.1	26.2	26.1	24.5
Leven	54,000	30,345	35.7	31.2	34.4	34.4	22,700	13,621	32.5	29.9	33.1	32.5
Mid-Lothian	27,000	10,810	50.0	50.0	48.5	45.4	3,400	1,881	36.4	39.1	35.6	36.6
Moray	6,000	5,856	20.6	20.7	19.6	21.8	370	370	18.6	20.0	16.2	18.3
Nairn	1,800	1,646	21.5	20.4	20.3	20.1	80	80	16.0	15.1	16.9	16.5
Orkney	20,000	11,316	35.2	34.6	26.3	19.9	1,000	1,000	15.6	13.4	14.7	8.7
Peebles	4,300	2,389	35.8	35.1	32.9	32.3	1,477	296	30.6	30.1	33.9	30.0
Perth	51,000	32,880	31.2	28.3	29.0	31.2	17,000	11,787	28.8	27.6	30.0	28.7
Renfrew	19,000	8,210	46.2	44.1	35.6	38.6	16,100	6,413	50.6	42.4	33.7	41.8
Ross and Cromarty	13,000	12,935	20.1	21.4	18.6	21.1	2,409	8,328	14.4	16.6	16.2	16.5
Ross and Cromarty	17,000	10,459	31.6	35.1	33.9	32.6	11,470	7,928	28.3	35.3	38.3	30.9
Selkirk	2,500	1,535	32.9	34.3	45.0	34.9	2,610	1,969	28.1	36.5	43.4	35.2
Shetland	1,562	1,562	24.3	27.3	33.7	27.1	1,700	8,389	17.5	17.6	22.8	18.1
Stirling	25,000	10,696	47.3	44.5	44.5	37.5	21,000	8,389	51.3	44.4	44.5	42.8
Strathclyde	4,300	4,553	18.8	20.8	21.0	19.6	1,300	1,607	16.5	18.0	17.9	15.2
West Lothian	16,000	6,473	47.8	47.4	48.7	43.0	1,800	1,855	44.8	41.8	39.2	39.9
Wigtown	12,000	5,445	29.2	25.0	30.8	28.6	13,400	6,082	40.7	21.6	26.4	28.2
Total	681,400	408,322	33.3	31.3	32.4	31.6	268,714	167,868	32.1	31.0	31.9	30.9

TABLE No. 6.—HAY from Permanent Grass:—TOTAL PRODUCE, ACREAGE, and YIELD PER ACRE, in 1929, in each COUNTY OF SCOTLAND, distinguishing HAY from TIMOTHY MEADOWS and HAY from OTHER MEADOWS.

COUNTIES	TIMOTHY MEADOWS.			OTHER MEADOWS.		
	Total Produce in 1929.	Acreage in 1929.	Yield per Acre in 1929.	Total Produce in 1929.	Acreage in 1929.	Yield per Acre in 1929.
	Tons.	Acres.	Cwt.	Tons.	Acres.	Cwt.
Aberdeen	9	5	37·4	1,900	1,750	21·5
Angus	830	347	47·7	1,500	1,059	28·2
Argyll	830	444	37·4	18,000	14,520	25·0
Ayr	31,000	13,179	47·8	15,000	9,011	38·7
Banff . . . . .	..	..	..	410	356	22·7
Berwick	110	83	26·5	3,400	2,465	27·3
Bute	100	58	34·4	760	443	34·1
Caithness . . . . .	..	..	..	290	728	8·0
Clackmannan	2,900	1,034	56·3	620	271	45·4
Dumbarton	2,900	1,169	40·2	2,000	1,333	29·5
Dumfries	5,100	3,451	20·5	23,000	16,042	28·3
East Lothian	60	23	56·8	2,200	1,462	30·9
Fife	3,700	1,484	50·2	4,800	3,576	26·9
Inverness	6	7	16·0	9,300	8,708	21·3
Kincardine . . . . .	..	..	..	370	291	25·5
Kinross	360	192	37·0	590	346	34·0
Kirkcudbright	4,200	2,388	34·8	14,000	11,987	23·6
Lanark	15,000	7,584	38·7	7,700	6,037	25·4
Mid-Lothian	1,600	663	49·2	1,800	1,230	29·4
Moray . . . . .	..	..	..	370	394	13·9
Nairn . . . . .	..	..	..	80	96	16·0
Orkney . . . . .	..	..	..	1,000	1,294	15·6
Peebles	580	286	40·2	1,600	1,188	27·0
Perth	7,800	3,209	48·3	9,200	8,578	21·6
Renfrew	11,000	4,077	54·7	5,100	2,336	43·5
Ross and Cromarty	9	7	25·0	2,400	3,321	14·3
Roxburgh	470	305	30·7	1,000	7,623	28·2
Selkirk	140	96	30·0	2,700	1,893	28·0
Shetland . . . . .	..	..	..	1,700	2,062	17·5
Stirling	13,000	5,912	62·4	3,000	2,477	24·6
Sutherland . . . . .	..	..	..	1,800	1,607	16·5
West Lothian	2,200	782	55·8	820	573	28·5
Wigtown	2,900	1,047	55·4	9,500	5,035	37·6
Total	111,804	47,836	47·0	157,410	120,032	26·2

TABLE No. 7.—NUMBER OF HORSES, CATTLE, SHEEP, AND PIGS IN EACH COUNTY OF SCOTLAND AS RETURNED ON 4TH JUNE 1929.

COUNTIES.	HORSES (including Ponies).				CATTLE.				SHEEP.				PIGS.					
	Used solely for Agriculture, &c.	Stallions,†	Unbroken Horses.		Other Horses.	Cows in Milk.	Cows in Calf, but not in Milk.	Heifers in Calf.	Bulls used for Service.	Other Cattle.		Ewes kept for Breeding.	Rams to be used for Service.	1 Year Old and above.	Under 1 Year.	Boars used for Service.	Other Pigs.	
			1 Year & Under above.	Under 1 Year.						2 Years & above.	1 Year & Under 1 Year.							
1. Aberdeen	18,709	53	2,772	1,028	2,501	37,986	3,156	1,897	1,661	42,439	55,863	38,563	134,748	4,045	35,523	199,379	2,163	16,145
2. Angus	7,188	1	400	89	593	10,233	781	657	447	17,685	19,281	8,186	80,056	2,690	19,680	92,861	740	5,261
3. Argyll	3,704	9	441	171	455	17,223	2,498	1,789	866	7,994	11,970	12,958	358,065	10,670	109,072	255,486	394	8,693
4. Ayr	6,056	26	745	285	900	42,380	6,637	10,101	2,233	9,808	10,599	20,366	174,143	4,990	47,244	162,867	860	8,508
5. Banff	5,470	8	867	318	688	10,693	1,004	562	446	6,315	13,071	11,346	38,855	1,184	47,244	45,974	79	4,006
6. Berwick	3,319	12	333	70	461	8,775	729	928	289	7,339	13,071	11,346	38,855	1,184	40,321	204,371	656	3,115
7. Bute	8,000	4	122	38	125	2,628	846	508	171	1,188	2,017	1,966	19,662	583	6,894	15,984	46	1,891
8. Caithness	3,684	14	508	215	492	5,970	627	322	163	2,030	5,616	5,317	77,590	2,201	20,795	87,111	194	28
9. Clackmannan	397	..	53	19	74	1,107	232	149	62	846	1,146	403	5,790	153	1,204	5,681	35	4
10. Dumfriesshire	1,129	18	114	39	134	5,170	1,292	765	265	1,376	2,045	1,937	31,514	996	8,678	26,508	95	10
11. Dumfries	4,399	13	726	217	751	18,937	3,290	5,465	1,170	9,503	16,991	15,213	256,017	6,301	64,980	248,476	1,092	96
12. East Lothian	2,659	4	191	42	148	9,293	340	401	139	5,643	4,716	1,958	58,237	1,751	23,522	75,762	64	8,532
13. Fife	6,235	13	850	284	797	10,562	1,438	1,340	560	12,637	12,055	7,943	52,149	1,997	11,129	69,712	780	126
14. Inverness	5,582	29	546	206	526	17,138	2,313	1,271	561	6,622	9,873	12,614	246,444	6,510	79,724	178,941	226	37
15. Kinross	3,394	2	313	108	448	5,838	452	321	288	6,921	9,873	12,614	246,444	6,510	79,724	178,941	226	37
16. Kirkcaldy	3,690	2	146	84	46	1,164	163	157	80	2,009	9,873	12,614	246,444	6,510	79,724	178,941	226	37
17. Kirkcubright	3,005	10	515	164	425	17,092	1,151	5,186	970	9,448	14,150	10,881	167,747	4,733	49,736	165,446	966	103
18. Lanark	5,234	81	565	161	596	27,470	6,316	1,512	1,512	7,675	11,703	10,312	104,280	2,862	80,012	99,623	77	6,400
19. Mid-Lothian	2,633	10	157	47	418	7,255	838	585	291	3,641	3,778	1,923	73,407	1,819	27,196	87,745	140	11,833
20. Moray	3,210	19	463	180	316	6,066	489	299	236	4,801	8,034	5,838	22,200	566	5,801	22,256	404	42
21. Nairn	885	3	126	49	174	1,995	150	104	101	767	2,011	2,052	5,751	257	2,433	5,213	95	14
22. Orkney	4,659	8	453	186	365	9,108	1,092	788	230	4,644	9,976	9,498	20,584	551	5,144	28,228	200	25
23. Peebles	662	1	45	9	105	1,661	264	514	132	1,180	1,987	1,457	95,867	2,831	19,821	94,466	105	11
24. Perth	8,436	41	964	598	917	15,362	1,776	1,560	865	13,882	21,788	15,638	298,403	9,073	81,228	264,798	879	98
25. Renfrew	1,785	16	182	66	389	10,593	2,558	2,007	552	1,889	3,332	3,121	139,563	4,051	60,710	121,749	341	29
26. Ross & Cromarty	5,061	4	479	178	450	14,491	1,982	1,149	409	4,718	8,378	8,314	189,364	5,252	97,026	17,654	368	41
27. Roxburgh	2,858	8	267	66	596	4,757	707	885	344	6,015	6,522	5,050	284,593	5,980	71,475	84,280	56	2,648
28. Selkirk	457	1	20	16	69	1,094	164	202	66	450	1,195	864	86,443	1,768	20,880	75,369	86	1
29. Shetland	1,770	25	246	78	1,684	4,418	659	355	77	1,047	2,369	2,495	77,895	2,497	28,310	84,280	2	2
30. Stirling	2,734	7	318	180	342	6,627	1,875	1,680	527	6,772	8,123	4,670	56,172	1,485	50,024	50,024	238	29
31. Sutherland	1,631	5	100	32	154	3,793	646	243	76	1,941	1,870	1,870	94,346	2,257	47,869	10,342	46	8
32. West Lothian	1,452	4	192	61	182	4,001	676	601	217	2,368	2,362	1,570	7,838	193	4,417	10,342	198	27
33. Wigtown	3,584	20	736	274	374	25,162	1,135	3,446	1,004	7,654	10,768	10,338	59,600	1,688	14,556	58,796	865	116
Total	123,357	421	14,969	5,073	17,185	355,631	46,771	51,839	16,991	215,578	301,324	245,401	2,231,067	90,525	974,877	3,209,031	16,180	1,812
																		124,375

* Including Mares kept for breeding.

† Above two years old used, or intended to be used, for service.

TABLE NO. 8.—QUANTITY AND VALUE OF CORN, &c., imported into the United Kingdom in the undermentioned Years.

[From Trade and Navigation Returns.]

	Quantities.			Values.		
	1927.	1928.	1929.	1927.	1928.	1929.
	Cwt.	Cwt.	Cwt.	£	£	£
Wheat from—						
United States	35,619,001	23,662,487	22,265,950	21,944,763	13,186,725	11,742,051
Argentine Republic	19,452,492	24,899,294	45,378,474	11,752,641	13,888,830	22,906,500
British India	5,010,319	1,546,232	141,189	3,184,274	940,650	78,134
Australia	14,837,906	10,233,345	12,797,402	9,464,181	6,151,952	6,840,517
Canada	32,181,355	41,005,492	27,102,852	19,655,849	22,088,930	14,162,371
Other countries	3,334,742	2,730,621	3,993,551	2,058,076	1,432,832	2,054,925
Total	110,435,815	103,577,471	111,769,398	68,059,784	57,633,019	57,784,498
Wheat, meal, and flour, from—						
France	69,705	108,169	577,593	45,424	59,981	286,646
United States	2,915,736	1,913,686	2,536,495	2,343,607	1,419,113	1,850,350
Argentine Republic	810,314	820,716	753,779	439,241	407,700	330,846
Australia	1,776,514	930,568	1,332,439	1,377,515	696,962	878,380
Canada	5,129,087	4,879,588	3,723,966	4,179,276	3,549,075	2,568,214
Other countries	259,561	224,164	774,174	170,096	133,999	433,597
Total	10,960,907	8,926,841	9,703,446	8,555,159	6,265,930	6,333,433
Barley	16,418,510	12,975,345	11,978,171	8,938,592	6,685,233	5,517,689
Oats	5,907,035	7,447,051	7,063,944	2,454,832	3,737,107	2,800,161
Peas, not fresh	1,463,204	1,702,460	1,681,013	1,764,042	1,907,740	1,627,232
Beans, not fresh	830,113	1,262,612	1,518,342	536,915	805,694	1,092,682
Maize	41,927,968	33,015,892	34,911,588	15,336,094	14,775,878	15,283,057
Maize products	1,890,247	2,882,630	2,877,692	848,071	1,390,195	1,406,682
Oat products	523,580	697,771	681,399	615,046	796,374	753,767
Rice—						
From Spain	533,117	512,091	364,439	518,445	469,503	323,634
From United States	324,363	333,745	437,559	403,180	388,456	436,676
From British India	724,970	695,357	751,374	506,308	471,383	492,382
From other countries	903,897	969,435	829,304	594,412	554,609	539,539
Other kinds of grain	590,600	453,490	419,203	343,396	287,195	276,609
Other products	455,364	455,446	475,645	456,624	500,117	513,122
Malt	49,200	41,374	46,125	48,457	41,815	44,373
Farinaceous substances	1,196,189	1,167,207	926,634	990,661	985,965	741,229
Total of corn, &c.	73,738,897	64,661,906	64,962,432	34,355,053	33,747,234	31,553,734

TABLE NO. 9.—RETURN OF THE AVERAGE PRICES OF WOOL in the Years 1928 and 1929.

Years.	Australian.	South African.	English Fleeces.
	Per lb.	Per lb.	Per lb.
	s. d.	s. d.	s. d.
1928	1 9½	1 6½	1 10½ to 2 4½
1929	1 7½	1 6½	1 4½ „ 1 10½

TABLE No. 10.—QUANTITIES AND VALUES OF CORN, MEAT, FOOD PRODUCTS, AND ARTICLES AFFECTING AGRICULTURE, imported into the United Kingdom in the Year 1929, with the Corresponding Figures for 1927 and 1928.

[From Trade and Navigation Returns.]

	Quantities.			Values.		
	1927.	1928.	1929.	1927.	1928.	1929.
	No.	No.	No.	£	£	£
ANIMALS, LIVING:—						
Cattle	636,868	724,917	750,262	11,796,857	12,707,613	13,014,626
Sheep and lambs	584,397	591,691	584,681	1,876,071	1,436,370	1,417,684
Pigs	894,740	318,286	311,102	2,337,369	1,890,372	1,948,868
Total value	1,616,005	1,634,894	1,645,995	15,510,297	16,034,355	16,376,847
GRAIN, FLOUR, &c.:—	Cwt.	Cwt.	Cwt.	£	£	£
Wheat	110,435,816	103,677,471	111,769,898	68,069,784	57,623,019	57,784,498
Wheat meal and flour . . .	10,960,907	8,926,841	9,708,446	8,555,159	6,265,930	6,333,433
Barley	16,418,510	12,976,345	11,978,171	8,938,592	6,685,233	5,517,689
Oats	5,907,035	7,447,051	7,063,044	2,454,832	3,737,107	2,800,161
Peas, not fresh	1,463,204	1,702,400	1,681,013	1,764,042	1,907,740	1,627,232
Beans, not fresh	830,113	1,262,612	1,518,342	536,913	815,694	1,092,582
Maize or Indian corn . . .	41,927,968	33,015,892	34,911,588	15,336,004	14,775,878	15,238,657
Maize products	1,890,247	2,382,630	2,377,692	848,071	1,390,195	1,406,682
Oat products	523,560	697,771	681,394	615,016	796,314	753,767
All other products	455,864	455,446	475,645	456,021	500,117	513,122
Malt	49,260	41,374	46,125	48,467	41,815	44,873
Rice—						
From Spain	533,117	512,091	364,439	518,445	460,503	323,684
From United States	324,833	333,745	437,559	403,160	388,456	436,376
From British India	724,970	695,357	751,374	506,306	471,383	492,382
From other countries	903,397	969,435	829,304	594,412	554,609	589,639
Other kinds of grain	500,600	453,490	419,203	343,396	287,195	276,009
Farinaceous substances not elsewhere specified	1,196,189	1,167,207	926,634	990,601	935,965	741,229
Total value	195,135,619	177,166,218	186,435,276	110,969,996	97,616,188	96,971,665
MEAT:—	Cwt.	Cwt.	Cwt.	£	£	£
Beef, salted	8,313	5,599	6,399	34,580	28,106	21,105
*Beef	13,416,627	12,256,851	11,715,745	29,450,988	31,033,296	31,412,005
*Mutton	5,522,559	5,043,492	5,653,979	17,494,847	19,460,231	19,084,552
Bacon	8,481,965	8,852,878	8,281,415	33,679,205	40,348,408	43,760,297
Hams	688,728	942,031	1,023,627	4,653,577	4,608,996	5,473,273
Pork, salted (not bacon or hams)	47,020	42,207	62,212	94,001	77,667	104,674
*Pork	504,572	634,541	592,745	2,166,156	2,488,652	2,496,291
Tinned, canned extracts, including tongue	1,253,804	1,276,527	1,201,795	6,432,215	6,741,187	6,345,870
All other kinds	269,179	304,307	334,727	595,452	731,116	886,060
*Rabbits (dead)	260,151	243,352	243,034	752,232	746,335	744,335
Total of dead meat	30,052,981	30,301,875	29,121,778	100,389,853	106,257,025	110,328,462
DAIRY PRODUCE:—	Cwt.	Cwt.	Cwt.	£	£	£
Butter	5,818,611	6,112,972	6,406,623	43,204,721	52,044,506	54,784,313
Margarine	1,186,235	1,102,575	950,084	4,045,193	3,581,296	2,738,711
Cheese	2,919,082	3,005,237	2,994,524	13,493,668	14,997,173	13,914,630
Total	9,922,918	10,220,784	10,351,231	65,743,582	70,622,974	71,438,163

* Fresh, Chilled, and Frozen.

TABLE No. 10—Continued.

	Quantities.			Values.		
	1927.	1928.	1929.	1927.	1928.	1929.
POULTRY (alive or dead). . .	..	..	..	£ 2,979,584	£ 2,884,851	£ 3,152,431
GAME (alive or dead) . . .	..	..	..	94,638	122,226	87,244
Eggs in Shell . . .	Gt. Hunds. 24,340,850	Gt. Hunds. 26,466,490	Gt. Hunds. 24,961,808	15,914,257	17,766,214	17,855,625
Eggs not in Shell . . .	Cwt. 678,006	Cwt. 682,973	Cwt. 796,814	3,388,317	3,251,535	3,683,350
Total value . . .	..	..	..	22,326,791	24,024,826	24,808,050
FRUIT, VEGETABLES, &c.:—	Cwt.	Cwt.	Cwt.	£	£	£
Apples . . .	6,101,267	6,089,068	5,762,821	7,271,741	7,837,776	7,069,948
Cherries . . .	124,909	79,657	143,807	275,614	172,877	315,804
Plums . . .	597,398	480,256	505,810	1,079,278	906,313	1,044,558
Pears . . .	1,077,545	859,874	1,078,511	1,460,044	1,427,514	1,665,616
Grapes . . .	718,167	839,186	862,277	1,986,796	2,017,762	2,015,788
Oranges . . .	7,898,374	7,760,989	9,271,309	8,593,440	7,896,072	9,811,990
Lemons, Limes, &c. . .	1,243,747	1,128,859	1,366,623	1,187,167	1,251,778	1,429,207
Bananas . . .	Bunches. 12,896,115	Bunches. 12,965,921	Bunches. 14,937,929	5,750,243	5,611,693	5,639,590
Unenumerated . . .	Cwt. 1,158,773	Cwt. 1,251,649	Cwt. 1,356,432	2,176,094	2,199,300	2,608,241
Onions . . .	Bushels. 9,895,394	Bushels. 10,154,326	Bushels. 10,685,711	2,071,504	2,463,756	2,268,487
Potatoes . . .	Cwt. 5,831,557	Cwt. 9,521,365	Cwt. 5,868,151	8,941,501	4,915,308	3,174,755
Tomatoes . . .	Cwt. 2,332,046	Cwt. 2,304,870	Cwt. 2,751,450	4,262,611	4,416,724	4,210,146
Vegetables, unenumerated } (raw)	..	..	..	1,511,028	1,564,009	1,575,812
Total value . . .	..	..	..	41,517,261	42,682,432	42,824,942
OTHER ARTICLES:—	Tons.	Tons.	Tons.	£	£	£
Lard . . .	119,552	122,340	181,065	7,585,423	7,504,874	7,807,956
Wool—sheep and lambs' . .	Centals. 8,219,599	Centals. 7,792,537	Centals. 8,136,278	59,774,149	60,496,035	59,805,648
Wood and timber—	Loads.	Loads.	Loads.			
Hewn (pit-props or pit- } wood)	2,864,493	2,596,886	2,695,242	5,457,824	4,779,080	5,034,492
Sawn soft . . .	6,025,932	4,605,073	5,221,472	23,289,995	21,435,525	23,165,196
Staves . . .	104,159	101,416	125,075	739,871	678,081	787,084
Oilseed-cake (not sweetened)	Tons. 407,618	Tons. 381,781	Tons. 494,264	3,942,221	3,538,958	4,554,694
Seeds—	Cwt.	Cwt.	Cwt.			
Clover and grass . . .	322,066	264,666	304,119	975,340	734,765	702,743
Cotton . . .	Tons. 536,646	Tons. 574,484	Tons. 569,438	4,919,074	5,620,430	5,270,019
Flax or linseed . . .	352,951	348,355	285,498	5,608,357	5,495,698	4,963,024
Rape . . .	8,303	36,939	31,383	164,659	659,221	518,024
Soya beans . . .	83,121	191,611	210,931	929,735	2,202,618	2,407,016
Bones (whether burnt or not)	4,536	4,780	4,039	85,264	40,676	39,627
Guano . . .	10,427	5,544	17,762	82,757	49,964	146,232
Basic slag . . .	79,346	67,710	55,204	195,736	163,642	127,106
Superphosphates . . .	187,380	127,216	148,001	414,040	266,201	351,538
Phosphate of lime and rock } phosphate	404,396	274,623	377,557	577,735	378,069	518,948
Nitrate of soda (cubic nitre)	Cwt. 1,570,801	Cwt. 1,552,589	Cwt. 1,572,508	945,092	831,950	768,222
Cotton, raw of 100 lb.	Centals. 15,488,393	Centals. 15,075,799	Centals. 15,584,205	66,009,269	79,204,897	75,577,147
Hemp . . .	Tons. 101,497	Tons. 94,031	Tons. 94,095	4,183,280	3,480,907	3,478,541
Flax . . .	47,705	83,392	44,934	3,603,332	3,174,715	3,807,297
Hides untanned—	Cwt.	Cwt.	Cwt.			
Dry . . .	722,086	809,230	524,756	3,322,211	4,880,241	2,644,193
Wet . . .	810,282	693,539	648,175	3,091,386	3,452,822	2,477,147
Petroleum . . .	Gallons. 1,886,320,290	Gallons. 1,610,847,839	Gallons. 1,709,870,884	33,687,297	33,340,088	33,661,181

TABLE NO. 11.—QUANTITY AND VALUE OF DEAD MEAT imported into the United Kingdom in the undermentioned Years.

	Quantities.			Values.		
	1927.	1928.	1929.	1927.	1928.	1929.
BACON, from—	Cwt.	Cwt.	Cwt.	£	£	£
Sweden	478,861	441,066	379,866	2,037,571	1,803,732	2,008,808
Denmark	5,090,785	5,375,793	4,977,926	28,351,251	25,282,888	27,229,516
Netherlands	796,746	1,061,356	901,298	3,798,964	4,636,793	4,630,191
United States	641,438	537,859	634,594	2,829,284	2,171,567	2,879,414
Irish Free State	450,835	555,097	497,139	2,434,828	2,758,386	2,788,766
Canada	503,084	306,795	199,466	2,238,950	1,370,533	1,036,240
Other countries	525,169	574,912	692,026	2,698,362	2,264,519	3,187,869
Total	8,451,968	8,852,878	8,281,415	36,679,205	40,846,408	43,760,297
BEEF (salted), from—						
United States	5,056	2,784	1,684	27,442	16,078	6,870
Other countries	3,255	2,815	4,715	7,435	7,028	14,235
Total	8,311	5,599	6,399	34,880	23,106	21,105
BEEF (fresh and refrigerated)—						
United States	78,020	40,764	36,015	321,151	212,160	196,745
Uruguay	585,112	776,647	947,217	1,303,224	1,955,667	2,531,047
Argentine Republic	11,548,413	9,413,063	9,060,324	25,355,579	24,295,048	24,658,070
Australia	642,743	1,011,217	926,500	1,299,485	2,212,774	2,114,268
New Zealand	324,260	456,163	125,271	629,263	948,677	299,093
Other countries	238,079	558,997	620,349	878,286	1,408,972	1,613,182
Total	18,416,627	12,256,851	11,715,745	29,486,958	31,033,298	31,412,005
HAMS, from—						
United States	716,104	759,831	841,602	3,718,803	3,703,155	4,484,860
Canada	133,724	115,276	98,091	715,341	574,982	538,711
Other countries	38,901	66,924	89,134	219,738	330,856	450,193
Total	888,728	942,031	1,028,827	4,653,877	4,608,995	5,473,273
TINNED, CANNED EXTRACTS—						
Beef	1,039,512	1,061,127	944,668	5,085,135	5,299,302	4,712,221
Mutton	48,780	20,626	31,501	196,058	86,161	119,769
Pork	104,864	123,817	143,900	1,011,839	1,102,708	1,234,744
„ Other descriptions	60,708	70,957	81,666	189,183	258,016	286,136
Total	1,253,864	1,276,527	1,201,705	6,482,215	6,741,187	6,345,870
ALL OTHER KINDS—						
Tinned or Canned	9,378	15,460	25,775	53,784	75,692	136,418
Salted	853	221	333	1,810	467	1,213
Other descriptions	258,948	288,626	308,569	539,858	654,987	748,429
Total	269,179	304,307	334,727	595,452	731,146	886,060
MUTTON (fresh and refrigerated)—						
Uruguay	317,252	403,396	366,605	811,274	1,102,047	1,060,115
Argentine Republic	1,536,438	1,511,468	1,545,162	4,235,364	4,672,751	4,771,176
Australia	624,817	546,527	563,490	1,958,766	1,815,571	2,018,630
New Zealand	2,726,972	2,794,805	2,746,087	9,631,320	10,658,784	10,025,399
Other countries	317,035	387,296	402,635	858,123	1,211,098	1,209,232
Total	5,522,559	5,643,492	5,653,979	17,494,847	19,460,281	19,084,552
PORK (salted), from—						
Denmark	32,982	20,407	45,277	89,282	33,771	51,035
United States	10,842	10,579	11,790	46,440	37,019	40,131
Other countries	3,196	2,511	5,145	8,279	6,877	15,508
Total	47,020	42,297	62,212	94,001	77,667	104,674
PORK (fresh and refrigerated)—						
Irish Free State	317,839	387,724	296,217	1,347,861	1,550,066	1,298,028
New Zealand	86,227	121,658	169,460	333,381	406,010	633,027
Argentine Republic	44,658	57,803	69,697	201,768	229,841	306,054
United States	33,752	58,078	47,366	302,109	261,105	224,596
Other countries	17,596	9,278	9,985	81,037	89,630	34,586
Total	504,572	634,541	592,745	2,166,156	2,486,652	2,496,291
RABBITS (dead), from—						
Belgium	36,701	45,500	38,815	186,846	217,198	190,005
Irish Free State	28,489	26,786	27,497	84,873	82,406	84,579
Australia	176,938	146,722	157,232	419,798	367,885	396,194
New Zealand	6,279	11,619	10,028	16,862	27,916	27,894
Other countries	11,749	12,725	10,362	44,853	50,920	45,663
Total	260,151	243,352	243,934	752,232	746,885	744,335
- Total of dead meat	30,652,981	30,201,870	29,121,778	100,389,853	106,257,025	110,828,462

TABLE NO. 12.—QUANTITIES AND VALUES OF BUTTER, MARGARINE, CHEESE, AND EGGS imported into the United Kingdom in each Year from 1927 to 1929 inclusive.

[From Trade and Navigation Returns.]

	Quantities			Values		
	1927.	1928.	1929.	1927.	1928	1929.
BUTTER from—	Cwt.	Cwt.	Cwt.	£	£	£
Russia . . .	350,422	336,252	290,314	2,595,180	2,656,372	2,299,050
Finland . . .	205,177	198,883	233,593	1,687,345	1,787,023	1,952,445
Sweden . . .	165,951	175,570	243,301	1,415,620	1,549,557	2,112,561
Denmark . . .	1,994,764	2,016,045	2,204,027	17,646,132	18,613,677	19,736,873
Netherlands . .	170,235	129,445	129,507	1,407,246	1,094,863	1,065,920
France . . .	65,994	69,460	44,693	515,121	543,713	350,296
United States . .	672	2,151	70	5,818	17,154	599
Argentine Republic . .	420,058	366,015	302,882	3,301,769	2,894,473	2,537,187
Irish Free State . .	586,485	559,167	566,177	4,560,157	4,529,496	4,579,937
Australia . . .	488,721	872,385	768,173	2,836,345	6,561,515	6,342,454
New Zealand . . .	1,252,475	1,222,277	1,313,139	10,320,248	10,228,352	11,355,362
Canada . . .	423	1,646	8	3,613	13,805	68
Other countries . .	117,234	163,176	305,739	910,127	1,304,506	2,452,061
Total . . .	5,818,611	6,112,972	6,406,623	48,204,721	52,044,506	54,784,813
MARGARINE from—	Cwt.	Cwt.	Cwt.	£	£	£
Netherlands . . .	1,159,163	1,077,019	918,141	3,954,108	3,491,131	2,623,897
France . . .	4,083	4,305	3,764	14,592	15,241	12,417
Irish Free State . .	16,515	16,121	21,301	59,806	58,706	77,492
Other countries . .	5,464	5,130	6,878	16,667	16,217	24,905
Total . . .	1,185,225	1,102,575	950,084	4,045,193	3,581,295	2,738,711
CHEESE from—	Cwt.	Cwt.	Cwt.	£	£	£
Netherlands . . .	228,066	228,507	195,766	1,003,390	961,701	777,549
Italy . . .	141,446	141,558	132,021	657,305	658,806	646,082
United States . . .	17,193	5,458	7,122	77,207	29,233	32,747
Australia . . .	35,493	73,770	49,699	155,850	363,117	223,061
New Zealand . . .	1,611,869	1,554,364	1,801,699	7,173,947	7,586,336	8,302,042
Canada . . .	843,943	920,060	723,343	4,007,275	4,904,705	3,412,699
Other countries . .	71,072	81,520	84,874	418,194	488,275	520,459
Total . . .	2,949,082	3,005,237	2,994,524	13,493,668	14,997,173	13,914,639
EGGS from—	Great Hundreds.	Great Hundreds.	Great Hundreds.	£	£	£
Russia . . .	1,586,487	1,766,845	608,161	800,646	867,841	322,758
Denmark . . .	5,679,640	5,329,669	5,573,841	4,592,587	4,387,146	4,609,144
Poland (including Dantzg) . .	3,387,956	2,561,969	2,384,711	1,547,506	1,255,905	1,240,403
Netherlands . . .	2,359,895	2,725,247	3,162,437	1,711,810	2,103,988	2,511,576
Belgium . . .	2,141,321	2,907,901	2,901,644	1,535,931	2,131,965	2,241,397
France . . .	429,509	1,658,881	867,799	320,958	1,080,634	651,455
Italy . . .	87,407	57,616	30,986	74,512	44,305	26,133
Egypt . . .	668,544	809,638	572,472	290,609	350,624	240,253
China . . .	681,011	944,680	1,624,087	395,177	557,399	996,012
United States . . .	92,880	91,789	17,954	64,556	72,885	14,143
Irish Free State . .	5,051,523	5,177,301	5,015,072	3,126,638	3,247,078	3,325,881
Australia . . .	122,172	266,977	378,239	107,049	233,589	318,661
Canada . . .	42,099	83,323	79,157	38,352	64,841	66,541
Other countries . .	2,009,906	2,084,654	1,685,168	1,807,926	1,367,984	1,201,268
Total . . .	24,340,850	26,466,490	24,961,808	15,914,257	17,766,214	17,855,625

TABLE No. 13.—NUMBER AND VALUE OF LIVE CATTLE, SHEEP, AND PIGS imported into the United Kingdom in the undermentioned Years. [*From Trade and Navigation Returns.*]

	Number.			Value.		
	1927.	1928.	1929.	1927.	1928.	1929.
CATTLE, from—				£	£	£
Irish Free State . . .	629,001	724,372	749,570	11,580,426	12,691,550	12,997,788
Canada	7,629	405	..	211,085	13,263	..
United States . . .	..	..	..	..	..	..
Other countries . . .	193	140	692	5,846	2,800	16,837
Total	636,828	724,917	750,262	11,796,857	12,707,613	13,014,625
SHEEP AND LAMBS, from—						
Irish Free State . . .	584,397	591,691	584,631	1,376,071	1,436,370	1,417,834
Other countries . . .	..	..	..	..	..	..
Total	584,397	591,691	584,631	1,376,071	1,436,370	1,417,834
Pigs, from—						
Irish Free State . . .	394,740	318,286	311,102	2,337,369	1,890,372	1,943,888
Other countries . . .	..	..	..	..	..	..
Total	394,740	318,286	311,102	2,337,369	1,890,372	1,943,888

TABLE No. 14.—NUMBER OF HORSES, CATTLE, SHEEP, AND PIGS imported into Great Britain from Ireland in each of the Years 1923-1929.

	1923.	1924.	1925.	1926.	1927.	1928.	1929.
†HORSES :—							
Stallions	444	400	396	411	457	480	495
Mares	11,487	12,760	7,356	5,209	4,655	4,290	3,962
Geldings	11,474	13,060	7,566	5,954	5,855	4,956	4,395
Total	23,405	26,220	15,318	11,574	10,967	9,726	8,852
CATTLE: Oxen, Bulls, and Cows :—							
Fat	283,666	345,167	246,829	257,934	284,498	319,983	339,512
Store	459,503	629,016	456,354	393,161	348,723	419,682	414,308
Other cattle . . .	43,236	62,970	40,986	46,607	53,679	65,267	71,031
Calves	26,315	40,553	36,573	22,742	25,892	49,255	57,618
Total	812,720	1,077,706	780,692	720,444	712,792	854,187	882,469
SHEEP :—							
Sheep	156,970	277,543	167,789	216,502	273,388	269,675	250,328
Lambs	292,182	363,746	268,653	306,860	367,660	401,062	412,456
Total	449,152	641,289	436,442	523,362	641,048	670,737	662,784
Pigs :—							
Fat	314,316	179,611	55,883	185,565	338,961	293,855	265,147
Store	3,425	6,389	2,368	1,698	4,371	1,492	3,648
Total	318,241	186,000	58,251	187,263	343,332	295,347	268,795

† Not including Army Horses.

EDINBURGH CORN MARKET.

STATEMENT SHOWING THE PRICES OF WHEAT, BARLEY, AND OATS FOR THE YEAR 1929.

The offering of grain by farmers and others in the area of the Market was not resumed during the year. It is hoped that advantage will be taken of the privilege afforded to farmers and merchants of offering grain in the open market, as undoubtedly it enables them to secure the market value, and gives a desirable indication of the true value of the various grains.

The Corn Sales Act of 1921 provides that all sales are to be effected by weight only, and expressed in terms of or by reference to the hundredweight of 112 lb. Experience has proved it to be convenient to quote at a price per 4½ cwt. for Wheat, 4 cwt. for Barley, and 3 cwt. for Oats.

The following statement gives a record of the year's proceedings in Edinburgh Corn Market.

1929.	WHEAT, per 4½ cwt.				BARLEY, per 4 cwt.				OATS, per 3 cwt.			
	Highest.		Lowest.		Highest		Lowest		Highest.		Lowest.	
	s.	d.	s.	d.	s.	d.	s.	d.	s.	d.	s.	d.
January	2	—	—	—	Holiday	Market						
"	0	44	0	40	42	0	30	0	27	0	24	6
"	16	44	0	40	42	0	33	0	27	6	25	0
"	23	44	6	44	43	0	33	0	27	9	25	6
"	30	44	6	44	43	0	35	0	28	0	25	6
February	6	45	6	43	42	0	32	0	28	0	25	6
"	13	45	6	42	42	0	33	0	28	0	25	6
"	20	45	6	42	42	0	33	0	27	9	25	6
"	27	44	6	43	41	0	32	0	27	6	25	6
March	6	45	0	43	42	0	33	0	28	0	25	6
"	13	45	0	43	42	0	33	0	28	0	25	6
"	20	45	0	43	43	0	33	0	28	0	26	0
"	27	44	0	42	43	0	34	0	28	3	27	0
April	3	44	6	40	42	0	34	6	28	3	27	0
"	10	45	0	41	42	0	35	0	28	3	27	3
"	17	44	6	41	43	0	35	0	28	3	27	6
"	24	44	0	40	43	0	33	0	28	3	27	3
May	1	44	0	40	43	0	33	0	28	3	27	0
"	8	42	0	38	42	0	32	0	27	9	26	6
"	15	41	0	37	42	0	33	0	27	3	26	0
"	22	41	0	37	41	0	33	0	27	0	25	9
"	29	39	6	37	40	0	32	0	26	9	25	6
June	5	40	6	38	40	0	32	0	26	9	25	6
"	12	40	6	38	40	0	32	0	26	9	25	0
"	19	40	6	37	40	0	33	0	26	6	25	0
"	26	41	6	39	40	0	33	0	26	6	25	0
July	3	43	0	42	40	0	33	0	27	0	25	6
"	10	45	0	44	40	0	33	0	27	3	26	0
"	17	50	0	48	40	0	33	0	28	3	26	3
"	24	52	6	49	..	..	..	..	28	6	27	0
"	31	55	0	51	..	..	..	..	28	6	27	0
August	7	50	0	49	..	..	..	..	28	0	26	0
"	14	49	0	47	..	..	..	..	27	6	26	0
"	21	50	0	49	..	..	..	..	27	6	25	6
"	28	49	0	48	41	0	33	0	27	0	25	0
September	4	49	3	49	42	0	37	0	27	0	25	6
"	11	49	0	48	42	0	36	0	26	6	25	6
"	18	43	0	40	41	0	34	0	25	0	23	0
"	25	43	0	40	40	0	34	0	24	6	23	0
October	2	41	0	36	38	0	33	0	23	6	21	6
"	9	41	0	37	38	0	31	0	23	0	21	6
"	16	42	0	35	38	0	30	0	22	6	21	0
"	23	41	0	36	38	0	31	0	22	6	21	0
"	30	42	6	41	38	0	34	0	22	6	21	6
November	6	43	6	40	38	6	34	0	22	6	21	6
"	13	42	0	40	37	0	32	0	21	6	19	6
"	20	42	6	41	37	0	30	0	21	6	19	6
"	27	43	0	42	37	0	28	0	21	0	19	3
December	4	44	0	43	37	0	32	0	20	6	18	6
"	11	44	0	43	36	0	30	0	20	6	18	6
"	18	44	6	43	36	0	30	0	20	0	18	0
"	25	44	6	44	36	0	30	0	19	6	18	0
"	31	45	0	44	36	0	30	0	19	6	18	0

PRICES OF SHEEP SINCE 1818.

TABLE No. 1.—CHEVIOT SHEEP.

Year.	Wethers		Ewes.		Lambs.	
	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.
1818	28 0	30 0	not quoted.	8 0	to 10 0	
1819	25 0	27 0	15 0	to 17 0	10 6	12 0
1820	20 0	25 0	16 0	" 17 0	10 0	11 0
1821	18 0	20 0	14 0	" 16 0	7 6	8 0
1822	12 6	13 0	8 0	" 8 6	4 6	0 0
1823	18 6	18 0	7 0	" 10 6	5 6	6 0
1824	14 0	19 0	7 0	" 9 0	4 6	6 0
1825	29 0	32 0	16 0	" 19 0	9 0	10 6
1826	17 6	21 6	13 0	" 15 0	7 0	7 6
1827	15 0	24 0	not quoted.	7 0	" 8 0	
1828	18 0	27 6	12 0	to 15 0	7 0	8 3
1829	18 0	24 6	12 6	" 14 0	7 0	8 6
1830	15 0	21 0	8 0	" 11 0	6 0	6 9
1831	18 0	25 0	9 0	" 13 0	7 0	8 6
1832	19 0	24 0	11 0	" 16 0	7 0	9 0
1833	22 0	31 0	13 6	" 20 0	8 0	11 3
1834	22 0	31 0	13 6	" 21 0	9 0	11 6
1835	22 0	27 6	18 0	" 20 6	8 0	11 0
1836	24 0	31 6	16 0	" 19 0	10 0	14 0
1837	19 0	28 0	14 0	" 19 0	10 0	13 0
1838	23 0	30 6	17 0	" 22 0	12 0	14 0
1839	23 0	31 0	14 0	" 19 0	0 0	13 0
1840	24 0	33 0	15 0	" 23 0	7 0	11 6
1841	23 0	30 0	14 0	" 22 0	8 0	12 0
1842	22 6	28 0	13 0	" 17 0	7 6	10 0
1843	19 0	25 0	8 0	" 12 0	5 0	8 0
1844	21 0	29 0	10 0	" 16 0	8 0	10 6
1845	23 0	33 0	13 0	" 20 0	8 0	13 0
1846	24 0	33 6	14 6	" 21 6	10 0	14 6
1847	24 0	35 0	13 0	" 24 0	11 6	15 0
1848	23 0	34 6	13 0	" 28 0	11 6	15 0
1849	21 0	30 2	12 0	" 21 0	0 0	14 0
1850	20 6	29 6	12 0	" 20 0	8 0	13 0
1851	21 6	31 0	13 0	" 21 0	8 9	14 0
1852	21 0	32 0	15 0	" 23 0	8 0	14 0
1853	26 6	38 0	17 0	" 28 6	9 0	17 0
1854	25 0	36 0	17 0	" 26 0	9 0	16 6
1855	23 6	36 0	16 0	" 25 0	10 0	17 0
1856	22 0	35 6	15 6	" 24 0	10 0	15 0
1857	24 0	36 0	14 6	" 26 0	10 6	14 6
1858	24 0	34 6	14 0	" 24 6	10 6	14 0
1859	25 0	34 6	16 0	" 26 0	10 3	14 9
1860	26 0	38 0	17 6	" 27 6	12 6	17 6
1861	25 0	38 6	16 0	" 28 0	9 0	16 0
1862	27 0	37 6	17 6	" 28 0	10 0	16 0
1863	25 0	38 6	19 0	" 28 6	10 6	16 0
1864	31 0	41 0	21 0	" 31 6	14 0	18 0
1865	32 6	44 0	22 6	" 33 6	14 6	20 0
1866	37 0	50 0	29 0	" 42 6	15 0	26 0
1867	26 0	58 0	18 0	" 25 6	12 0	16 0
1868	30 0	32 0	15 6	" 21 0	7 6	13 0
1869	28 0	38 0	15 0	" 22 6	7 6	14 0
1870	35 0	43 0	18 0	" 28 0	10 0	17 0
1871	36 6	49 0	22 0	" 33 6	14 0	20 0
1872	45 0	56 0	32 0	" 42 0	16 0	22 0
1873	42 0	51 0	25 0	" 42 0	15 6	22 0
1874	33 6	44 6	21 0	" 36 0	12 0	17 0
1875	33 0	48 6	21 0	" 34 0	13 6	23 6
1876	40 0	52 6	23 0	" 30 0	13 6	26 0
1877	41 0	51 0	25 0	" 37 0	15 0	24 0
1878	35 6	48 0	23 6	" 35 0	14 0	23 0
1879	34 0	44 0	21 0	" 34 0	14 0	20 0

TABLE No. 1.—CHEVIOT SHEEP—Continued.

Year.	Wethers.		Ewes.		Lambs.	
	s.	d.	s.	d.	s.	d.
1880	30	0 to 48	6	20	0 to 30	0
1881	32	0 " 45	6	29	0 " 34	0
1882	40	0 " 51	0	30	0 " 40	0
1883	44	0 " 55	6	34	6 " 46	6
1884	36	0 " 47	6	29	6 " 41	6
1885	50	0 " 58	0	24	0 " 31	0
1886	52	0 " 40	0	21	0 " 29	0
1887	29	0 " 36	0	18	0 " 26	0
1888	30	0 " 38	0	19	0 " 27	0
1889	36	0 " 44	0	24	0 " 32	0
1890	31	0 " 40	0	22	0 " 30	0
1891	27	0 " 38	0	16	0 " 25	0
1892	22	0 " 30	6	18	0 " 22	0
1893	26	0 " 35	6	18	0 " 28	6
1894	26	0 " 37	0	20	0 " 31	0
1895	28	0 " 39	0	22	0 " 34	0
1896	24	6 " 34	0	19	0 " 30	6
1897	27	0 " 36	0	21	0 " 31	6
1898	27	0 " 37	0	22	0 " 32	6
1899	24	0 " 33	0	20	0 " 30	6
1900	26	0 " 36	0	22	0 " 32	6
1901	25	0 " 32	6	20	0 " 29	6
1902	24	0 " 31	6	18	0 " 27	0
1903	26	0 " 34	0	21	0 " 31	0
1904	28	6 " 36	6	28	0 " 32	6
1905	27	6 " 35	0	23	0 " 33	0
1906	30	0 " 38	0	26	0 " 34	6
1907	28	0 " 34	0	22	0 " 30	6
1908	26	0 " 32	6	21	0 " 27	6
1909	24	0 " 31	0	18	0 " 25	6
1910	27	0 " 35	0	22	0 " 31	0
1911	24	0 " 31	6	18	6 " 27	6
1912	26	0 " 34	6	22	0 " 31	0
1913	30	0 " 39	0	24	0 " 36	6
1914	32	6 " 41	0	28	0 " 39	0
1915	36	0 " 46	0	31	0 " 44	0
1916	40	6 " 51	0	34	0 " 49	0
1917	43	6 " 56	0	38	0 " 56	0
1918	50	0 " 66	0	42	0 " 61	0
1919	53	0 " 69	0	44	6 " 67	0
1920	56	0 " 91	0	48	0 " 79	0
1921	45	0 " 60	0	52	3 " 85	0
1922	40	0 " 56	0	56	0 " 90	6
1923	44	0 " 65	0	61	0 " 106	0
1924	41	0 " 61	0	60	0 " 100	0
Ewe lambs—						
40 0 to 55 6						
Wether lambs—						
31 6 to 58 0						
Ewe lambs—						
36 0 to 82 0						
Wether lambs—						
22 3 to 50 6						
Ewe lambs—						
25 6 to 66 6						
Wether lambs—						
26 3 to 42 0						
Ewe lambs—						
25 3 to 52 0						
Wether lambs—						
23 3 to 39 0						
Ewe lambs—						
23 0 to 45 0						
Wether lambs—						
22 9 to 47 0						
Ewe lambs—						
30 6 to 51 9						
Wether lambs—						
25 6 to 47 0						
1925	39	3 " 50	0	56	0 " 68	9
1926	35	0 " 49	3	34	6 " 64	6
1927	28	9 " 46	3	32	6 " 55	6
1928	28	3 " 48	6	30	6 " 55	6
1929	33	6 " 54	6	34	6 " 62	0

TABLE No. 2.—BLACKFACE SHEEP.

Year.	Wethers.				Ewes.				Lambs.						
	s.	d.	s.	d.	s.	d.	s.	d.	s.	d.	s.	d.			
1819	22	0	to	24	0	12	0	to	15	0	8	0	to	9	0
1820	20	0	"	23	8	15	6	"	17	0	7	0	"	8	6
1821	18	0	"	20	0	12	0	"	18	0	6	0	"	7	0
1822	11	6	"	13	6	5	6	"	6	0	4	6	"	0	0
1823	12	0	"	16	0	5	0	"	6	6	4	0	"	5	8
1824	9	6	"	18	6	6	0	"	7	0	4	0	"	5	0
1825	22	0	"	26	0	11	0	"	18	6	6	0	"	9	0
1826	15	0	"	17	0	8	0	"	9	0	4	6	"	6	0
1827	14	0	"	18	6	7	0	"	10	0	6	0	"	7	6
1828	15	0	"	20	0	8	0	"	11	0	5	0	"	7	6
1829	14	0	"	18	0	9	0	"	10	0	6	0	"	7	0
1830	9	6	"	13	0	4	0	"	6	0	4	6	"	6	0
1831	13	0	"	17	0	5	0	"	7	6	5	0	"	6	6
1832	14	0	"	18	0	7	0	"	11	6	6	0	"	7	8
1833	16	0	"	24	0	7	6	"	12	0	6	6	"	9	0
1834	16	0	"	22	0	10	0	"	13	0	6	0	"	8	6
1835	15	0	"	18	9	10	0	"	18	0	7	0	"	8	0
1836	15	0	"	21	0	9	0	"	12	0	8	6	"	11	0
1837	13	0	"	16	0	8	0	"	12	0	8	0	"	9	6
1838	15	0	"	20	6	10	0	"	13	0	not quoted.				
1839	15	0	"	22	0	10	0	"	12	0	7	0	to	8	8
1840	15	0	"	22	6	11	0	"	12	0	7	0	"	9	8
1841	16	0	"	20	0	9	0	"	11	0	6	0	"	8	0
1842	14	0	"	19	0	7	6	"	8	0	5	6	"	7	0
1843	not quoted.				4	9	"	6	6	not quoted.					
1844	15	0	to	21	0	6	6	"	10	0	5	0	to	8	0
1845	14	0	"	23	0	8	0	"	12	0	6	0	"	8	0
1846	18	0	"	24	0	10	0	"	13	0	8	0	"	9	0
1847	20	6	"	25	0	10	0	"	14	0	8	6	"	9	6
1848	20	0	"	24	0	11	3	"	12	0	8	6	"	10	0
1849	not quoted.				not quoted.				7	0	"	7	6		
1850	..				9	0	to	12	0	7	0	"	0		
1851	17	6	to	23	0	9	0	"	12	0	6	6	"	8	0
1852	18	6	"	22	0	9	6	"	12	0	4	6	"	7	9
1853	23	0	"	27	0	14	6	"	16	6	5	0	"	11	6
1854	20	0	"	26	0	11	0	"	16	6	8	0	"	10	6
1855	23	6	"	26	6	14	0	"	16	0	10	0	"	11	0
1856	17	0	"	24	0	10	0	"	20	0	7	6	"	10	0
1857	20	0	"	29	0	10	6	"	15	0	9	8	"	11	0
1858	20	0	"	27	6	9	9	"	18	9	8	3	"	10	6
1859	20	0	"	25	0	10	0	"	14	0	8	9	"	11	0
1860	21	0	"	27	3	11	0	"	16	0	10	0	"	13	6
1861	21	0	"	29	0	12	0	"	22	0	6	3	"	14	0
1862	16	9	"	27	0	12	0	"	18	8	6	0	"	12	0
1863	20	0	"	30	6	13	0	"	16	0	8	0	"	11	6
1864	25	0	"	30	0	15	0	"	19	0	10	0	"	18	6
1865	15	6	"	32	6	15	0	"	25	0	10	0	"	17	0
1866	31	6	"	40	0	20	0	"	36	0	13	6	"	22	6
1867	20	0	"	30	6	14	0	"	22	0	7	6	"	18	6
1868	20	0	"	26	0	10	6	"	18	6	7	0	"	13	0
1869	22	0	"	28	0	11	0	"	14	0	6	9	"	9	0
1870	27	0	"	32	6	13	0	"	22	0	8	0	"	14	6
1871	23	0	"	37	0	13	0	"	23	0	11	0	"	16	8
1872	31	6	"	45	0	18	0	"	32	0	12	6	"	18	0
1873	28	0	"	39	0	16	6	"	27	0	7	0	"	16	0
1874	25	0	"	35	0	13	0	"	20	0	7	0	"	14	0
1875	26	6	"	37	6	15	0	"	21	8	9	6	"	17	6
1876	30	0	"	40	0	19	0	"	24	0	13	0	"	20	6
1877	35	0	"	38	9	18	0	"	25	0	13	6	"	23	0
1878	30	0	"	36	0	17	0	"	28	0	12	0	"	22	0
1879	25	0	"	35	9	16	0	"	24	0	10	6	"	20	0
1880	25	0	"	38	0	16	6	"	22	6	10	0	"	17	0
1881	30	0	"	39	0	15	0	"	23	0	10	0	"	15	0
1882	33	0	"	46	0	20	0	"	28	0	12	6	"	18	6
1883	36	0	"	50	6	24	6	"	33	0	14	0	"	21	6
1884	29	0	"	43	6	19	6	"	28	0	12	0	"	19	6
1885	24	0	"	34	0	13	0	"	22	6	10	0	"	15	0
1886	25	0	"	34	0	12	0	"	22	0	10	6	"	16	0
1887	22	0	"	30	0	11	0	"	19	0	8	0	"	13	0
1888	22	0	"	32	0	13	0	"	24	0	10	0	"	15	0
1889	23	0	"	40	0	18	0	"	29	0	13	0	"	22	0

TABLE No. 2.—BLACKFACE SHEEP—Continued.

Year.	Wethers.				Ewes.				Lambs.			
	s.	d.	s.	d.	s.	d.	s.	d.	s.	d.	s.	d.
1890	24	0	to	37	0	14	0	to	27	0	10	6
1891	21	0	"	37	0	10	0	"	24	0	7	6
1892	16	0	"	28	6	6	0	"	17	0	8	0
1893	21	0	"	37	0	12	0	"	24	0	7	0
1894	20	0	"	37	0	14	6	"	26	6	8	6
1895	23	0	"	41	0	16	0	"	28	6	9	0
1896	19	0	"	35	4	13	0	"	24	0	6	0
1897	21	0	"	36	6	15	0	"	25	6	7	0
1898	22	0	"	37	0	16	0	"	26	6	8	0
1899	20	0	"	33	6	18	0	"	24	0	5	6
1900	23	0	"	36	0	16	0	"	26	6	8	0
1901	20	0	"	35	0	14	0	"	25	6	6	6
1902	18	6	"	34	0	12	0	"	24	0	6	0
1903	21	0	"	36	0	15	0	"	28	0	7	0
1904	23	0	"	38	6	18	0	"	30	0	8	6
1905	21	6	"	37	0	19	0	"	31	0	9	0
1906	23	0	"	38	0	20	0	"	33	0	10	0
1907	21	0	"	33	6	17	0	"	28	0	8	6
1908	19	6	"	30	0	15	0	"	24	6	8	0
1909	17	0	"	28	0	11	6	"	22	0	6	3
1910	21	0	"	32	6	16	0	"	27	6	8	0
1911	19	0	"	29	6	14	0	"	24	0	7	0
1912	21	6	"	32	6	17	0	"	27	6	9	6
1913	24	6	"	36	0	21	0	"	31	0	12	6
1914	27	0	"	38	6	25	0	"	34	6	15	6
1915	31	0	"	42	6	29	0	"	39	6	17	0
1916	33	0	"	46	6	31	0	"	42	0	19	6
1917	36	0	"	51	0	33	0	"	47	0	21	0
1918	41	0	"	56	0	36	0	"	50	0	27	0
1919	44	0	"	62	0	39	0	"	54	0	29	0
1920	46	0	"	66	0	44	0	"	62	0	31	0
1921	32	9	"	60	9	35	3	"	62	6	20	3
1922	40	3	"	63	0	40	6	"	74	0	18	0
1923	46	0	"	65	6	43	0	"	78	0	21	0
1924	46	0	"	68	6	45	6	"	85	0	23	0
1925	36	0	"	60	0	40	0	"	78	0	17	6
1926	30	0	"	54	0	31	0	"	70	0	Wether lambs—	
											21	9
											"	49
1927	26	6	"	48	0	26	0	"	64	0	Ewe lambs—	
											19	0
											"	50
											Wether lambs—	
											17	9
											"	40
											Ewe lambs—	
											17	6
1928	29	0	"	45	9	24	0	"	57	0	"	37
											Wether lambs—	
											16	6
											"	33
											Ewe lambs—	
											17	0
1929	29	9	"	46	0	29	0	"	64	0	"	38
											Wether lambs—	
											20	9
											"	43
											Ewe lambs—	
											18	0
											"	37

TABLE NO. 3.—PRICE OF WOOL, PER STONE OF 24 LB., SINCE 1818.

Year.	Laid Cheviot.		White Cheviot.		Laid Highland.		White Highland.	
	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.
1818	40 0	to 42 2	..	..	20 0	to 22 6	..	..
1819	21 0	" 22 0	..	..	10 0	" 10 8	..	..
1820	20 0	" 22 0	..	..	9 0	" 10 0	..	..
1821	18 0	" 20 0	..	..	9 0	" 10 0	..	..
1822	12 6	" 14 6	..	..	5 0	" 6 6	..	..
1823	9 0	" 10 6	..	..	5 0	" 5 9	..	..
1824	13 6	" 15 0	..	..	6 0	" 6 8	..	..
1825	10 6	" 22 0	..	..	10 0	" 10 6	..	..
1826	11 0	" 14 0	..	..	5 0	" 5 6	..	..
1827	11 0	" 14 0	..	..	5 6	" 6 9	..	..
1828	8 0	" 11 0	..	..	5 6	" 6 0	..	..
1829	8 6	" 11 0	..	..	4 8	" 0 0	..	..
1830	9 6	" 11 0	..	..	4 6	" 5 0	..	..
1831	17 0	" 20 0	..	..	7 6	" 8 6	..	..
1832	14 0	" 16 0	..	..	7 0	" 7 6	..	..
1833	18 0	" 20 7	..	..	10 0	" 11 0	..	..
1834	21 0	" 24 6	..	..	5 6	" 7 0	..	..
1835	19 0	" 20 6	..	..	9 6	" 10 8	..	..
1836	21 0	" 25 0	..	..	19 0	" 14 0	..	..
1837	12 0	" 14 0	..	..	7 0	" 7 8	..	..
1838	19 0	" 22 6	..	..	6 0	" 10 0	..	..
1839	18 0	" 20 0	..	..	8 0	" 12 0	..	..
1840	15 0	" 0 0	..	..	7 0	" 0 0	..	..
1841	15 0	" 16 9	..	..	6 0	" 7 5	..	..
1842	12 6	" 14 0	..	..	not quoted.	..	..	..
1843	9 0	" 11 6	..	..	5 0	to 6 0	..	..
1844	15 0	" 18 0	..	..	not quoted.	..	..	..
1845	14 6	" 17 6	..	..	7 6	to 8 6	..	..
1846	12 0	" 14 6	..	..	8 0	" 8 6	..	..
1847	12 6	" 14 0	..	..	not quoted.	..	..	..
1848	9 6	" 11 0	..	..	4 9	to 0 0	..	..
1849	12 0	" 16 6	..	..	6 0	" 6 8	..	..
1850	15 0	" 17 6	..	..	8 0	" 8 6	..	..
1851	12 0	" 16 0	..	..	8 0	" 9 8	..	..
1852	18 0	" 15 0	..	..	8 0	" 9 0	..	..
1853	19 0	" 22 0	..	..	11 0	" 12 6	..	..
1854	12 0	" 15 0	..	..	7 6	" 8 6	..	..
1855	14 6	" 19 0	..	..	8 6	" 9 0	..	..
1856	19 0	" 21 6	..	..	11 0	" 6 0	..	..
1857	19 0	" 24 0	..	..	18 0	" 14 8	..	..
1858	15 0	" 17 0	..	..	8 9	" 10 0	..	..
1859	18 6	" 24 0	..	..	10 9	" 11 6	..	..
1860	22 0	" 32 0	87 0 to 88 0	..	10 0	" 11 8	..	..
1861	19 6	" 27 0	from 80s. upwards.	..	not quoted.	..	..	..
1862	18 6	" 26 0	30 0 to 37 0	..	11 6	to 16 0	..	..
1863	25 6	" 31 0	38 0 " 42 0	..	15 8	" 17 6	..	..
1864	31 0	" 39 0	47 0 " 54 0	..	17 6	" 20 0	..	..
1865	23 0	" 30 0	44 0 " 45 0	..	15 0	" 17 0	..	..
1866	24 0	" 30 0	80 0 " 38 0	..	14 0	" 16 0	..	..
1867	16 0	" 21 6	not quoted.	..	not quoted.	..	..	..
1868	19 0	" 26 0	28 0 to 32 0	..	8 6	to 9 0	..	..
1869	18 0	" 26 6	not quoted.	..	8 6	" 10 0	..	..
1870	15 0	" 23 6	25 0 to 26 0	..	9 6	" 0 0	..	..
1871	20 0	" 26 6	80 0 " 84 6	..	12 0	" 15 0	..	..
1872	26 0	" 27 6	40 0 " 48 0	..	18 0	" 21 0	..	..
1873	17 0	" 18 0	34 0 " 40 0	..	9 0	" 12 0	..	..
1874	18 6	" 26 6	30 0 " 34 0	..	9 6	" 13 0	..	..
1875	25 0	" 32 0	34 6 " 36 0	..	12 6	" 16 0	..	..
1876	20 0	" 24 0	80 0 " 84 6	..	9 6	" 12 0	..	..
1877	20 9	" 26 0	28 0 " 30 0	..	10 0	" 12 0	..	..
1878	18 9	" 25 0	27 0 " 32 0	..	8 6	" 11 6	..	..
1879	15 0	" 17 0	prices very low.	..	7 0	" 0 0	..	..
1880	20 0	" 24 0	30 0 to 32 0	..	10 6	" 11 6	14 0 to 15 0	..
1881	17 0	" 21 0	27 0 " 30 0	..	5 0	" 9 6	12 0 " 13 0	..
1882	14 0	" 16 0	27 6 " 28 0	..	7 6	" 9 0	18 0 " 14 0	..
1883	13 0	" 18 0	26 0 " 28 0	..	6 6	" 8 6	11 6 " 12 6	..
1884	13 0	" 18 0	26 0 " 28 0	..	6 6	" 8 6	11 6 " 12 6	..
1885	12 0	" 17 0	22 6 " 26 0	..	6 0	" 8 0	11 6 " 12 0	..
1886	18 0	" 16 0	28 0 " 27 6	..	6 6	" 8 6	11 6 " 12 0	..
1887	14 0	" 22 0	23 0 " 28 0	..	7 0	" 9 0	11 6 " 13 0	..
1888	13 0	" 20 0	28 0 " 28 0	..	7 0	" 9 0	11 0 " 12 6	..

TABLE NO. 3.—PRICE OF WOOL—*Continued.*

Year.	Laid Cheviot.		White Cheviot.		Laid Highland.		White Highland.	
	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.
1889	18 0	to 18 0	24 0	to 28 0	7 0	to 9 0	11 0	to 12 6
1890	18 0	" 18 0	24 0	" 28 0	7 0	" 9 0	11 0	" 12 6
1891	12 6	" 18 0	22 0	" 28 0	7 0	" 9 0	11 0	" 12 6
1892	12 0	" 18 0	20 0	" 28 0	7 0	" 8 6	10 6	" 12 0
1893	12 0	" 17 0	20 0	" 27 0	7 0	" 8 0	10 0	" 12 0
1894	12 0	" 16 0	20 0	" 26 0	7 0	" 8 0	10 0	" 12 0
1895	12 0	" 16 0	20 0	" 25 0	7 0	" 8 0	10 0	" 11 6
1896	11 0	" 15 0	19 0	" 24 0	7 0	" 8 0	10 0	" 11 6
1897	11 0	" 14 0	18 0	" 23 0	7 0	" 8 0	10 6	" 12 0
1898	10 0	" 13 0	16 0	" 20 0	7 0	" 8 0	10 0	" 11 6
1899	10 0	" 13 0	18 0	" 18 6	7 0	" 8 0	8 6	" 9 6
1900	9 9	" 12 0	18 0	" 18 6	6 9	" 7 9	8 0	" 9 6
1901	9 0	" 10 0	11 0	" 16 6	5 9	" 6 6	8 0	" 9 0
1902	9 0	" 10 0	11 6	" 17 0	6 0	" 6 6	8 6	" 9 6
1903	10 0	" 12 0	15 0	" 18 0	7 0	" 8 0	11 6	" 12 6
1904	15 0	" 17 0	20 0	" 21 0	9 0	" 10 0	14 0	" 15 0
1905	17 0	" 20 0	24 0	" 26 0	10 0	" 11 0	15 0	" 16 0
1906	18 0	" 21 0	27 0	" 28 6	11 6	" 13 0	16 6	" 17 6
1907	*		22 0	" 24 0	11 0	" 12 6	16 0	" 17 0
1908	*		16 0	" 18 0	†		8 0	" 8 6
1909	*		24 0	" 26 0	†		12 6	" 14 0
1910	*		25 0	" 30 0	†		13 0	" 14 6
1911	*		25 0	" 30 0	†		13 0	" 14 6
1912	*		24 0	" 29 0	†		14 0	" 15 0
1913	*		25 0	" 30 0	†		17 0	" 18 0
1914	*		24 0	" 29 0	†		15 0	" 16 6
1915†	*		42 0	" 46 0	†		21 0	" 22 0

* No Cheviots smeared now.

† No Highlands smeared now.

‡ These are July prices.

[See over

PRICE OF WOOL PER STONE OF 24 LB.—Continued.

		CHEVIOT.				HALF-BRED.				BLACK-FACE.		CROSS-BRED (BLACKFACE EWE AND LEICESTER RAM).			
		Hogg.		EWE AND WETHER.		Hogg.		EWE AND WETHER.		Hogg.	EWE AND WETHER.	Hogg.		EWE AND WETHER.	
		Washed.	Un- washed.	Washed.	Un- washed.	Washed.	Un- washed.	Washed.	Un- washed.			Washed.	Un- washed.	Washed.	Un- washed.
		s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.
1 1916	CAITHNESS & SUTH- ERLAND	36 6	30 0	33 0	27 6	34 6	28 6	33 0	27 6	23 0	23 0	28 6	25 6	28 6	25 6
		40 0	32 6	34 0	29 0	35 0	29 0	34 0	28 6						
1 1917	CAITHNESS & SUTH- ERLAND	40 6	33 0	37 0	31 0	38 6	31 6	37 0	31 0	25 6	25 6	31 6	28 6	31 0	28 6
		44 6	36 0	37 6	32 6	39 0	32 6	37 6	31 6						
1 1918	CAITHNESS & SUTH- ERLAND	43 6	35 6	39 6	33 0	41 0	33 6	39 6	33 0	27 0	27 0	33 6	30 6	33 6	30 6
		47 6	38 6	40 0	34 6	41 6	34 6	40 0	33 6						
1919	CAITHNESS & SUTH- ERLAND	84 0	70 0	82 0	66 0	82 0	62 0	70 0	56 0	34 0	34 0	46 0	39 0	44 0	38 0
		88 0	74 0	84 0	68 0	84 0	68 0	72 0	60 0						
1920	CAITHNESS & SUTH- ERLAND	86 0	70 0	83 0	66 0	74 0	54 0	65 0	50 0	24 0	24 0	35 0	29 0	34 0	27 0
		90 0	74 0	87 0	68 0	76 0	56 0	68 0	52 0						
1921	CAITHNESS & SUTH- ERLAND	22 0	17 0	19 0	15 0	18 6	14 6	16 0	13 0	9 6	9 6	12 0	10 0	12 0	10 0
		28 0	18 0	20 0	16 0	19 6	15 6	17 0	14 0						
1922	CAITHNESS & SUTH- ERLAND	30 0	25 0	26 0	22 0	26 0	20 0	22 0	18 0	16 0	16 0	16 6	15 0	16 6	15 0
		31 6	26 0	27 0	23 0	27 0	21 0	23 0	19 0						
1923	CAITHNESS & SUTH- ERLAND	41 0	34 0	36 0	30 0	33 0	27 0	30 0	25 0	17 6	17 6	20 0	18 0	20 0	18 0
		43 0	35 0	37 0	31 0	34 0	28 0	31 0	26 0						
1924	CAITHNESS & SUTH- ERLAND	58 0	49 0	53 0	45 0	49 0	40 0	45 0	39 0	25 6	25 6	34 6	30 6	33 0	30 0
		60 0	50 0	54 0	46 0	50 0	41 0	46 0	40 0						
1925	CAITHNESS & SUTH- ERLAND	49 0	34 0	36 0	30 0	33 6	28 6	32 0	27 0	25 6	25 6	26 0	23 6	25 6	23 0
		40 0	35 0	37 0	31 0	34 0	29 0	33 0	28 0						
1926	CAITHNESS & SUTH- ERLAND	35 0	29 0	32 0	28 0	32 0	26 6	28 0	24 6	19 0	19 0	22 6	20 0	22 0	19 6
		36 0	30 0	33 0	29 0	33 0	27 6	29 0	25 6						
1927	CAITHNESS & SUTH- ERLAND	38 0	31 0	35 0	31 0	34 6	29 6	32 0	27 6	24 0	24 0	27 0	25 6	27 0	25 0
		39 0	32 0	36 0	32 0	35 0	30 0	33 0	28 6						
1928	CAITHNESS & SUTH- ERLAND	51 0	43 0	48 0	41 0	47 0	40 0	43 0	37 0	24 6	24 6	33 0	31 0	32 0	30 0
		52 0	44 0	49 0	42 0	48 0	41 0	44 0	38 0						
1929	CAITHNESS & SUTH- ERLAND	37 0	32 0	34 0	29 0	34 0	29 0	32 0	27 0	24 0	24 0	27 0	25 0	26 0	24 0

1 The prices given were prices fixed by Government, and not free market prices.

GENERAL SHOW AT ALLOA, 1929.

THE Society's Ninety-eighth Show was held at Alloa on Tuesday, 23rd July, and three following days. This was the ninth Show held in the Stirling Show Division. All the previous Shows of the series were held at Stirling. The Show was favoured throughout with excellent weather.

The site in Alloa Park, which was placed at the disposal of the Society through the courtesy of the President, The Earl of Mar and Kellie, K.T., and the Town Council of Alloa, was one of the finest the Society has occupied. It was ample in extent, level, beautifully situated, and studded with fine trees, thus providing an ideal setting for the various Show buildings, and permitting of the Showyard being laid out on a liberal and convenient scale. A feature of the ground was its ready accessibility to visitors, both by road and rail.

The Town Council of Alloa provided a supply of water free of charge, this and gas being led to the ground at considerable expense; and the Council and officials of the town were indefatigable in their efforts to further the success of the Show.

In view of the favourable weather, the attendance of the public was somewhat disappointing. The total number who paid for admission was 57,075. This exceeded the attendance at the previous Show in the same district, Stirling in 1921, by about 5000. On that occasion, however, there was heavy rain on the Thursday and Friday. It was over 18,000 less than the attendance at Aberdeen last year. The falling off may be accounted for by the fact that the hay harvest was in full operation during the period of the Show.

There was a representative entry in all the sections of live-stock. Implements and other trade exhibits were more numerous than in the previous year, and provided an interesting and instructive display. The Live-Stock Judging Competition was continued, and attracted an entry of 160. As this number was the maximum which could take part in the competition, provided it was to be carried through in one day, it was felt that steps would require to be taken to limit the entries in the future.

While the accounts showed a small loss of about £95, it was generally recognised that, as a Show, the meeting at Alloa was a distinct success.

STATISTICS.

The following tables give the number of entries in the various sections :—

CATTLE.

Class.	SHORTHORN.	No. of Entries
1. Aged bulls		4
Extra Stock		1
2. Two-year-old bulls		9
3. Two-year-old bulls		2
4. One-year-old bulls		14
5. One-year-old bulls		16
6. Cows of any age in milk		5
7. Three-year-old cows		4
8. Two-year-old cows or heifers		6
9. One-year-old heifers		10
10. One-year-old heifers		6
		— 77

ABERDEEN-ANGUS.

11. Aged bulls	8
12. Two-year-old bulls	6
13. One-year-old bulls	7
14. One-year-old bulls	7
15. Cows of any age in milk	7
Extra Stock	1
16. Three-year-old cows in milk	6
17. Two-year-old cows or heifers	10
18. One-year-old heifers	18
19. One-year-old heifers	8
	— 78

GALLOWAY.

20. Aged bulls	5
21. Two-year-old bulls	1
22. One-year-old bulls	4
23. Cows of any age in milk	5
Extra Stock	1
24. Two-year-old cows or heifers	10
25. One-year-old heifers	12
	— 38

BELTED GALLOWAY.

26. Bulls born before 1st December 1927	5
27. Bulls born on or after 1st December 1927	6
28. Cows or heifers, born before 1st December 1926, in milk or in calf; if in calf and not in milk, to calve on or before 1st December of the year of the Show	5
Extra Stock	1
29. Heifers born on or after 1st December 1926 and before 1st December 1927	5
30. Heifers born on or after 1st December 1927	7
	— 29

HIGHLAND.

31. Aged bulls	1
32. Two-year-old bulls	5
33. One-year-old bulls	3
34. Cows of any age in milk	9
35. Three-year-old cows or heifers	2
36. Two-year-old heifers	5
37. One-year-old heifers	8
	— 33

AYRSHIRE.

38. Cows in milk, born before 1926	13
39. Cows in milk, born on or after 1st January 1926	6
40. Cows of any age, in calf, and due to calve before 1st December of the year of the Show	6
41. Heifers, born in or after 1st June 1926, in calf, and due to calve before 1st December of the year of the Show	6
42. Heifers born in 1927	8
43. Heifers born in 1928	9
44. Bulls born before 1927	3
Extra Stock	1
45. Bulls born in 1927	5
46. Bulls born in 1928	5
	— 62

BRITISH FRIESIAN.

47. Cows in milk, born in or before 1925	3
48. Cows in calf and not in milk, born in or before 1925	7
49. Cows in milk, born in 1926 or 1927	8
50. Heifers born in 1927	11
51. Heifers born before 1st July 1928	11
52. Heifers born on or after 1st July 1928	6
53. Bulls born in or before 1926	5
54. Bulls born in 1927	4
55. Bulls born in 1928	4
	— 59

RED POLL.

56. Cows in milk, or in calf, born before 1927	5
Extra Stock	2
57. Heifers born in 1927	4
58. Heifers born in 1928	4
59. Bulls born in or before 1927	4
60. Bulls born in 1928	4
	— 23

399

HORSES.

CLYDESDALE STALLIONS AND COLTS.

61. Aged stallions	9
Extra Stock	1
62. Three-year-old entire colts	7
63. Two-year-old entire colts	20
64. One-year-old entire colts	20
	— 57

CLYDESDALE GELDINGS.

65. Aged geldings	11
66. Three-year-old geldings	8
67. Two-year-old geldings	5
	— 24

CLYDESDALE MARES AND FILLIES.

68. Mares of any age with foal at foot	6
69. Yeld mares born before 1926	9
70. Three-year-old yeld mares or fillies	9
71. Two-year-old fillies	12
72. One-year-old fillies	17
	— 53

SHIRE.

73. Stallions or colts, born before 1928	7
74. Geldings, born before 1927	7
76. Yeld mares or fillies, born before 1928	7
Extra Stock	1
	— 22

SUFFOLK. (FOR EXHIBITION ONLY.)

Stallion, Gelding, and Mare	3
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HUNTERS.

76. Hunter brood mares, with foal at foot	7
77. Yeld mares, fillies, or geldings, born in 1926, in hand	10
78. Yeld mares, fillies, or geldings, born in 1927, in hand	13
79. Fillies, colts, or geldings, born in 1928, in hand	9
80. Mares or geldings, born before 1925, to carry 13 stone and over, in saddle	8
81. Mares or geldings, born before 1925, to carry under 13 stone, in saddle	8
82. Mares or geldings, born in 1925, in saddle	8
	— 63

HIGHLAND PONIES.

83. Stallions, born before 1927, not exceeding 14·2 hands	2
Extra Stock	1
84. Mares, born before 1927, not exceeding 14·2 hands, yeld or with foal at foot	7
85. Entire colts, born on or after 1st January 1927	1
86. Fillies, born on or after 1st January 1927	3
	— 14

WESTERN ISLAND PONIES.

87. Stallions, born before 1927, not exceeding 14 hands	2
Extra Stock	1
88. Mares, born before 1927, not exceeding 14 hands, yeld or with foal at foot	13
Extra Stock	2
89. Entire colts, born on or after 1st January 1927	4
90. Fillies, born on or after 1st January 1927	2
	— 24

SHETLAND PONIES.

91. Stallions, not exceeding 10½ hands, born before 1926	6
92. Entire colts, not exceeding 10½ hands, born in 1926 or 1927	4
93. Mares, not exceeding 10½ hands, with foal at foot	9
94. Yeld mares, not exceeding 10½ hands	6
95. Fillies, not exceeding 10½ hands, born in 1926 or 1927	5
	— 30

RIDING PONIES.

96. Mares or geldings, any age, over 12 hands and not exceeding 14 hands, in saddle, to be ridden by boy or girl 10 years and under 14 years of age on first day of Show	6
97. Mares or geldings, any age, not exceeding 12 hands, in saddle, to be ridden by boy or girl under 10 years of age on first day of Show	6
	— 12

HORSES IN HARNESS.

98. Yeld mares, fillies, or geldings, any age, in harness, exceeding 15 hands, to be driven in the ring	3
99. Yeld mares, fillies, or geldings, any age, in harness, over 14 hands, and not exceeding 15 hands, to be driven in the ring	4
100. Yeld mares, fillies, or geldings, any age, not exceeding 14 hands, to be driven in the ring	4
Extra Stock	1
	<hr/> 12

DRAUGHT GELDINGS IN HARNESS.

101. Draught geldings, any age, in harness, shown in cart or lorry (3)	8
	<hr/> 322

JUMPING.

1. Horses or ponies, any height	24
2. Horses or ponies, any height—handicap	23
3. Horses or ponies, any height	21
4. Horses or ponies, any height—handicap	22
	<hr/> 90

SHEEP.

BLACKFACR.

102. Tups above one shear	18
103. Shearling tups	34
104. Shearling tups—out-wintered	11
105. Tup lambs	11
106. Ewes above one shear, with lamb at foot	13
107. Shearling ewes or gimmers	21
	<hr/> 108

CHEVIOT.

108. Tups above one shear	11
109. Shearling tups	30
110. Tup lambs	16
111. Ewes above one shear, with lamb at foot	9
112. Shearling ewes or gimmers	17
	<hr/> 83

BORDER LEICESTER.

113. Tups above one shear	10
114. Shearling tups	20
115. Tup lambs	17
116. Ewes above one shear	12
117. Shearling ewes or gimmers	21
118. Ewo lambs	14
	<hr/> 94

HALF-BRED.

119. Shearling tups	2
120. Ewes above one shear	6
121. Shearling ewes or gimmers	10
122. Three ewe lambs	2
	— 20

OXFORD DOWN.

123. Shearling tups	7
124. Shearling ewes or gimmers	7
125. Tup lambs	9
126. Three ewe lambs	4
	— 27

SUFFOLK.

127. Tups one shear and over	3
128. Shearling ewes or gimmers	8
129. Tup lambs	15
130. Three ewe lambs	8
	— 34

SHROPSHIRE.

131. Tups, any age	5
132. Ewes or gimmers	3
	— 8

DORSET HORN.

133. Tups, any age	8
134. Ewes or gimmers	12
	— 10

FAT SHEEP.

135. Three fat lambs, any breed or cross, dropped in the year of the Show	9
136. Three fat lambs, out of blackface ewes, dropped on or after 1st March of the year of the Show . . . . .	...
	— 9
	—
	403

GOATS.

137. Male goats, any variety, over two years . . . . .	...
138. Male goats, any variety, over one but not exceeding two years	1
139. Male kids, any variety, not exceeding one year	4
140. Female goats, Toggenburg, British Toggenburg, Saanen, British Saanen, or British Alpine, in milk	3
141. Female goats, any other variety, in milk	4
142. Goatlings, any variety, over one but not exceeding two years	10
143. Female kids, any variety, not exceeding one year	11
	— 33

MILKING COMPETITIONS.

144. For quality, open to Classes 140 and 141 (6)	2
145. For quantity, open to Classes 140 and 141 (8) . . . . .	...
	<hr/> 2
	<hr/> 35

PIGS.

LARGE WHITE.

146. Boars born before 1928	8
147. Boars born in 1928	10
148. Boars born in 1929	18
149. Sows born before 1928	9
150. Sows born in 1928	14
151. Sows born in 1929	17
	<hr/> 76

MIDDLE WHITE.

152. Boars born before 1928	3
153. Boars born in 1929	4
154. Sows born before 1928	2
155. Sows born in 1928	1
156. Sows born in 1929	5
	<hr/> 15

LARGE BLACK.

157. Boars born before 1929	8
158. Boars born in 1929	7
159. Boars born before 1928	10
160. Sows born in 1928	10
161. Sows born in 1929	6
	<hr/> 41

LARGE WHITE USTER.

Classes 162, 163, 164—No entries.

132

POULTRY.

1-123 Poultry	<hr/> 561
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FUR-PRODUCING RABBITS.

1-10. Rabbits	<hr/> 102
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HONEY, &c.

OPEN CLASSES.

1. Collection of appliances suitable for a beginner's outfit for bee-keeping	3
2. Best and most complete frame hive for general use, with any improvements. Unpainted	5
3. Best and most complete hive. Unpainted. Price not to exceed 35s.	3

4. Six sections of comb honey	14
5. Six sections of heather honey	4
6. Six jars of run or extracted light-coloured honey, approximate weight 6 lb.	7
7. Six jars of run or extracted medium or dark-coloured honey, excluding heather honey, approximate weight 6 lb.	11
8. Six jars of pressed heather honey in liquid form, approximate weight 6 lb.	7
9. Six jars of granulated honey, approximate weight 6 lb.	6
10. Two shallow frames of comb honey for extracting purposes	14
11. Products made with the aid of honey	6
12. Best display of honey in any form suitable for a shop window in space 4 feet by 4 feet, weight of honey not to exceed 40 lb.	3
13. Best exhibit of not less than 1 lb. of wax in any form	10
14. Best exhibit of not less than 1 lb. of wax made into shapes for retail trade and over-counter trade	7
15. Observatory hive with queen and bees—two or more frames	4
16. Observatory hive with queen and bees—one frame, no super	1
	— 105

CONFINED TO SCOTTISH EXHIBITORS.

17. One standard frame of comb honey for extracting purposes	7
18. Six sections of comb honey	15
19. Six sections of heather honey	4
20. Six jars of run or extracted medium or dark-coloured honey, excluding heather, approximate weight 6 lb.	12
21. Six jars of run or extracted light-coloured honey, approximate weight 6 lb.	7
	— 45
	<u>150</u>

DAIRY PRODUCE.

1. Powdered butter, not less than 3 lb.	8
2. Fresh butter, three 1-lb. rolls	9
3. Cheddar cheese, 56 lb. and upwards	16
4. Cheese, 14 lb. and under	15
	— 48

WOOL.

PURE BREED CLASSES.

1. Blackface ewe	10
2. Blackface hogg	9
3. Cheviot ewe	6
4. Cheviot hogg	5
5. Border Leicester ewe	3
6. Border Leicester hogg	3
7. Half-bred ewe	4
8. Half-bred hogg	3
9. Oxford Down ewe	5
10. Oxford Down hogg	5
11. Suffolk ewe	4
12. Suffolk hogg	5
13. Dorset horn ewe	2
14. Dorset horn hogg	2
15. Shetland ewe	6
16. Shetland hogg	7
	— 79

RURAL INDUSTRIES.

1-25	309
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HORSE-SHOEING.

1 and 2	73
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LIVE STOCK JUDGING.

Open to persons not exceeding 25 years of age.	160
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ABSTRACT.

1. Cattle	399
2. Horses	322
Horses—Jumping	90
3. Sheep	403
4. Goats	35
5. Pigs	132
6. Poultry	561
7. Fur-Producing Rabbit	102
8. Honey, &c.	150
9. Dairy Produce	48
10. Wool	79
11. Rural Industries	309
12. Horse-Shoeing	73
13. Live Stock Judging	160
	<u>2863</u>

The following table gives a comparative view of the entries of cattle, horses, sheep, goats, pigs, poultry, rabbits, honey, dairy produce, wool, rural industries, &c., and implements, of the value of the premiums offered, and of the receipts at the entrance-gates, grand stands, and for catalogues at the Shows which have been held in the Stirling Show District:—

Year.	Cattle.	Horses.	Sheep.	Goats.	Pigs.	Poultry.	Rabbits.	Honey, &c.	Dairy Produce.	Wool.	Rural Industries.	Horse-Shoeing	Live Stock Judging Competition.	Implements.	Premiums.	Drawings at Show.
1883	238	68	60	..	40	..	..	..	..	..	..	..	..	22	£563	£311
1884	397	181	262	..	50	84	..	..	..	..	..	..	..	973	1350	1,729
1873	406	297	278	..	62	387	..	..	..	..	..	..	..	1400	1880	3,140
1881	336	215	211	..	29	294	..	..	..	..	..	..	..	2001	2940	2,577
1891	318	252	210	..	41	317	..	..	..	..	..	..	..	1563	2114	2,930
1900	321	238	369	..	28	457	..	..	66	24	..	..	..	2095	2895	4,305
1909	330	355	249	..	54	539	..	..	49	..	..	..	..	1977	3017	4,638
1921	367	279	299	59	188	582	..	66	66	56	..	..	..	2201	5055	12,764
1929	399	322	403	83	182	561	102	150	48	79	309	73	160	2414	6256	9,470

A COMPARISON.

The following figures relating to some of the most successful Shows the Society has held will be perused with interest :—

	Cattle.	Horses.	Sheep.	Goats.	Pigs.	Poultry.	Rabbits.	Total Live Stock.	Imple- ments.	Premiums.	Drawings at Show.	Profit.
Glasgow, 1867 .	286	212	257	..	58	150	..	963	1344	£1600	£3,005	£1307
Edinburgh, 1869 .	310	212	340	..	22	239	..	1123	1900	1600	4,078	2067
Glasgow, 1875 .	411	405	296	..	48	479	..	1639	2220	2605	6,231	3316
Edinburgh, 1877 .	339	342	305	..	30	234	..	1250	2292	2714	6,734	3710
Edinburgh, 1884 .	580	453	493	..	35	253	..	1814	2282	4343	6,548	1855
Edinburgh, 1893 .	380	349	294	..	81	360	..	1414	2263	2600	4,918	2823
Aberdeen, 1894 .	314	324	184	..	34	365	..	1221	2532	2440	5,121	1678
Perth, 1896 .	292	258	204	..	20	374	..	1148	1945	2205	4,788	2511
Glasgow, 1897 .	317	350	245	..	30	275	..	1217	2227	2897	4,392	2021
Edinburgh, 1899 .	386	518	477	..	46	551	..	1978	2585	3844	10,285	3911
Stirling, 1900 .	321	288	369	..	24	467	..	1403	2095	2915	4,305	1078
Inverness, 1901 .	360	257	204	..	22	499	..	1340	1460	2806	2,485	99
Aberdeen, 1902 .	330	253	243	..	42	475	..	1313	1988	2796	4,413	1604
Perth, 1904 .	348	315	283	..	35	413	..	1394	1972	3058	4,993	1828
Glasgow, 1905 .	310	462	284	..	60	534	..	1750	1875	3702	4,473	1203
Peebles, 1906 .	253	258	291	..	40	438	..	1280	1658	3072	2,596	416
Edinburgh, 1907 .	363	464	352	..	58	605	..	1842	2140	3614	7,061	2309
Aberdeen, 1908 .	331	299	237	..	42	509	..	1418	1931	3045	4,596	1881
Stirling, 1909 .	330	355	249	..	54	539	..	1527	1977	3017	4,638	1100
Dumfries, 1910 .	270	355	295	..	54	481	..	1455	1950	3057	3,411	562
Paisley, 1913 .	404	472	334	..	48	530	..	1798	1968	5109	6,468	2527
Edinburgh, 1919 .	215	301	221	60	43	398	..	1238	1606	4517	17,377	3275
Aberdeen, 1920 .	340	250	279	19	112	597	..	1597	2065	4608	14,120	1679
Stirling, 1921 .	367	279	299	59	188	582	..	1774	2201	5055	12,822	2350
Dumfries, 1922 .	422	272	339	41	229	584	..	1891	2156	5488	11,428	1090
Perth, 1924 .	406	283	366	21	202	760	..	2038	2382	5712	10,758	2311
Glasgow, 1925 .	461	340	349	31	178	577	178	2114	2570	6136	12,865	4226
Kelso, 1926 .	430	284	597	31	159	546	108	2155	2366	6004	9,218	324
Edinburgh, 1927 .	462	357	493	63	201	724	184	2484	2474	6049	12,315	2090
Aberdeen, 1928 .	421	277	340	25	80	578	120	1850	2377	6131	11,031	1842

CATTLE.

The total entry of Cattle, 399, again showed a slight reduction as compared with the preceding year. The number of absentees was, however, less than usual. Shorthorn entries numbered 77, and the quality of the exhibits was decidedly good. The President's Champion Medal for the best Shorthorn was won by Mr Albert James Marshall, Bridgebank, Stranraer, with his home-bred two-year-old bull "Bridgebank Vulcan," 221,490 (Fig. 34), which was Reserve for the Championship last year. A handsome low set roan bull, of great scale and substance, he was got by "Bridgebank Annum," 187,694, out of "Virtue," 39,759. This animal also secured for its owner the Duthie Perpetual Challenge Cup, the Tweeddale Gold Medal, and the special prize of £20 given by the Shorthorn Society for the best bull. The Reserve for the Championship, and the winner of the Shorthorn Society's special prize of £20 for the best female, was "Balnakyale

Symmetry 6th," 83,474, a beautiful roan two-year-old heifer, belonging to and bred by Mr James Cameron, Balnakyle, Munlochy.

Aberdeen-Angus Cattle, with 78 entries and few absentees, made an excellent display. Sir George Macpherson Grant, Bart., Ballindalloch, was successful in gaining the President's Champion Medal with "Roseleaf of Ballindalloch," 74,176 (Fig. 35), a remarkably fine six-year-old cow. She was bred by exhibitor, her sire being "Jorum of Ballindalloch," 43,920, and dam "Romanzo," 60,308. Besides the Championship this animal was awarded the Ballindalloch Challenge Cup for the best cow, the Falconer L. Wallace Silver Cup for best female, and the Aberdeen-Angus Cattle Society's Champion Gold Medal. Mr J. E. Kerr of Harviestoun, Dollar, with his home-bred three-year-old bull "Jipsey Eric," 62,088, secured the Reserve Championship and the Ballindalloch Challenge Cup for the best bull.

There was a satisfactory entry of Galloways, the total number being 38, and the quality was quite up to average. The President's Medal for the best animal of the breed went to Messrs James Wilson & Son, Tundergarth Mains, Lockerbie, for their "Ewanston Aster," 28,529 (Fig. 36), a well-fleshed seven-year-old cow. She was bred by Mr James Gilchrist, Ewanston, Balmaclellan, her sire being "Grange Aide-de-Camp," 14,369, and dam "Jenny 6th of Ewanston," 24,003. This animal was also awarded the Dr Gillespie Memorial Trophy.

Belted Galloways attracted a fair entry, numbering 29, and the quality was up to standard. The Championship went to Lieut.-Commander Sir August Cayzer, Bart., R.N., Gartmore, for his Royal Show Champion "Gartmore Helen 1st," 1322 B (Fig. 37), a remarkably fine two-year-old heifer. She was bred by exhibitor, being got by "Mark Hector," 56 B, out of "Gartmore Helen." The Knockbrex Challenge Cup was also awarded to the same animal.

The display of the popular Highland breed was larger than last year, the entries numbering 33, and these provided a picturesque exhibit. Leading honours were secured by Mrs M. Maze of Achnacloich, Connel, Argyll, who won the President's Champion Medal and the Highland Cattle Society's Perpetual Victory Challenge Cup for the best male animal, with "Culnadalloch II. of Achnacloich," 3441 (Fig. 38). This two-year-old home-bred bull, which was Reserve Champion at Aberdeen last year, was shown in perfect condition. His sire was "Royal Ernest," 3252, and dam "Mairi VII. of Achnacloich," 9549. The corresponding cup, given by the Highland Cattle Society for the best female, went to the Earl of Southesk, Kinnaird Castle, Brechin, for his Reserve Champion cow "Sidonia of Southesk," 9827.

In the Ayrshire Section there were 62 entries, as against 41 last year, and the quality was up to a high standard. An outstanding winner of the Championship Medal was "Meikle Kilmory Pansy 2nd," 91,249 (Fig. 39), a home-bred six-year-old cow shown by Mrs Mary M'Alister, Meikle Kilmory, Rothesay. Almost all brown in colour, this cow was got by "Carston General Haig," 20,783, her dam being "Meikle Kilmory Graceful," 73,081. Besides the Championship, she was awarded the Renfrewshire Perpetual Gold Challenge Cup and the Cowhill Champion Cup for the best animal of the Ayrshire breed.

British Friesians numbered 59 as against 51 in the preceding year, and it was generally conceded that the display was one of the best seen at a Highland Show. Lord Glentanar, Glen Tanar, Aboyne, secured the President's Champion Medal with "Drumry Butterfly," 115,434 (Fig. 40), a stylish two-year-old heifer, which was bred by Mr William Veitch, Drumry, Drumchapel, and got by the well-known sire "Douneside Pel Pilot 2nd," 28,371, out of "Overton Beatrice," 85,848. The MacRobert Champion Silver Bell also went to the same winner.

There was rather a small entry of Red Polls, but some good types of the breed were on view. The Champion animal was found in "Colton Erry," 14,468 (Fig. 41), a two-year-old home-bred bull belonging to Mr W. B. Robertson, Colton, Dunfermline. The Reserve Champion, and winner of the Kinmount Challenge Cup for the best female, was "Isle of Arran Julep," 39,630, bred and exhibited by the Duchess of Montrose.

HORSES.

Numerically the entry of Clydesdale Stallions was not so strong as last year, only the classes for two-year-old and yearling colts being well filled. The quality of the animals exhibited, however, especially in the aged class, was particularly good. The Champion animal was found in this class, being "Craigie Winalot," 21,322 (Fig. 42), a splendid type of draught horse belonging to Mr James Kilpatrick, Craigie Mains, Kilmarnock. Four years old, and bay in colour, he was bred by Mr Joseph Harper, Rathillet, Cupar-Fife, his sire being "St Albion," 21,126, and dam "St Mona," 47,926. In addition to the President's Champion Medal this animal was awarded the Paisley Perpetual Gold Challenge Cup and the Cawdor Challenge Cup for the best Stallion or Colt.

Clydesdale Geldings also were short in numbers as compared with the preceding year, but a good selection of weighty cart horses were on view. Mr Alexander Clark, Strathore, Thornton, secured the President's Champion Medal with "Dan"

(Fig. 43), a powerful brown four-year-old, bred by Mr Andrew Wilson, Fullwoodhead, Beith, and got by "Rockside Foot-print," 19,837.

Entries of Clydesdales Mares and Fillies numbered 53, being 10 more than at Aberdeen, and the quality was excellent. Mr Robert Park, Brunstane, Portobello, obtained premier honours with "Brunstane Phyllis" (Fig. 44). This outstanding prize-winning mare, which was shown in perfect condition, easily won the President's Champion Medal. She was bred by Mr R. M. Leslie, Murroes, Arbroath, her sire being "Brunstane Again," 20,717, and dam "Eva of Murroes," 54,664. The Cawdor Cup for best Clydesdale Mare or Filly, for which "Brunstane Phyllis" was not eligible, having won it in 1927, was awarded to the Reserve Champion, "Fyvie Primrose," a two-year-old filly belonging to Messrs T. & M. Templeton, Sandyknowe, Kelso.

Classes were again provided for Shire Horses, and the breed was well represented by many first-rate specimens. The President's Champion Medal was awarded to "Lockinge Ridgeway Rose," 119,877 (Fig. 45), owned by Mr A. Thomas Loyd, Lockinge House, Wantage. This noted four-year-old bay mare was bred by Messrs W. G. & E. H. Roberts, Great Hope, Leighton, Welshpool, being got by "Lincoln's What's Wanted 2nd," 35,812, out of "Elegance," 92,830.

Three representatives of the Suffolk breed, a stallion, a mare, and a gelding, were entered for exhibition only. These were the subject of favourable comment, and were each awarded the Society's Silver Medal.

There was a particularly good display of Hunters, the entries reaching a total of 63. The President's Champion Medal was won by Sir John William Buchanan-Jardine of Castlemilk, Bart., with "Glenholme" (Fig. 46), a home-bred three-year-old brown gelding, whose sire was "Harmonius" and dam "Carnew."

Highland and Western Island Ponies were more numerous than last year, there being an entry of 14 and 24 respectively. Mr J. Moncrieff Wright of Kinmonth, Bridge of Earn, won the President's Champion Medal for best Highland pony with "Glenbernesdale," 891 (Fig. 47), a fifteen-year-old grey stallion, which was shown as "Extra Stock." It was bred by Mr Kenneth MacDonald, Skeabost, Isle of Skye, and got by "Glenbruar," 331, out of "Maggie." The Champion of the Western Island Section was "Bonnie Charlie of Farr," 1124 (Fig. 48), a fine moving nine-year-old grey stallion belonging to Sir William Cross, Bart., of Scatwell, Muir of Ord. This animal was bred by the late Mr W. D. Mackenzie of Farr, its sire being "Prince Charlie II.," 653, and dam "Banchor of Farr," 2182.

Shetland Ponies numbered 30, being somewhat less than last year, but there was no lack of quality in the exhibits, which, as usual, attracted much attention. Mrs Etta Duffus, Penniwells, Elstree, Herts., again carried off the President's Champion Medal, the winning animal being "Duncan of Overacres," 1216 (Fig. 49), a beautiful four-year-old black stallion. Bred by Mrs E. E. Hedley, Overacres, Otterburn, it was sired by "Blackbird of Auchlochan," 658, out of "Diana of Weddiker," 3874.

There was a fair entry of Harness Horses. The President's Champion Medal was won by Mr William S. Miller, Balmanno Castle, Bridge of Earn, with the stylish moving six-year-old brown mare "Eastertide," 26,108 (Fig. 50), bred by Mr J. E. Tweedale, Barcroft, Rochdale, and got by "Southworth Swell," 11,219, out of "Hollin Glow-worm," 22,616.

The sections provided for Riding Ponies and Draught Geldings in Harness secured a fair entry. The Jumping Competitions were well supported with entries, and interest in the competitions was as keen as formerly.

SHEEP, PIGS, &C.

The number of Sheep entered was 403 as compared with 349 in the preceding year, and the principal breeds gave an excellent display. Goats were more numerous, and Pigs had a first-rate entry of 132. The winners of the President's Champion Medals are shown in Figs. 51 to 62.

The Sections for Poultry, Rabbits, Dairy Produce, Honey, Wool, and Rural Industries were moderately filled. The Horse-Shoeing Competition was up to the usual standard, and the work of the competitors was followed with much interest. The Live Stock Judging Competition secured an entry of 160, being about the maximum number that could take part in the competition in the course of one day. The interest of the public in the competition was even more marked than on former occasions.



Fig. 34 —SHORTHORN BULL, "BRIDGEBANK VULCAN" 221,490.

Winner of President's Medal for best Shorthorn animal, Alloa Show, 1920. Bred by and the property of Mr. Albert James Marshall, Bridgeland Stranraer. Age two years and six months.



Fig. 35 —ABERDEEN ANGUS COW, "ROSIEFAE OF BALLINDALLOCH" 74,176.

Winner of President's Medal for best Aberdeen Angus animal, Alloa Show 1929. Bred by and the property of Sir George Macpherson Grant, Bart., Ballindalloch Home Farms, Ballindalloch. Age six years and three months.



Fig 38 — HIGHLAND BULL, 'CUNADATTOCH II OF ACHNATOCH' 3141

Winner of President's Medal for best Highland animal (Allot Show 1921) Bred by and the property of Mr. M. Mac Lachlanloch, Cannel Argyll. Age two years and two months



Fig 39 — AYRSHIRE COW, "MIRRIE KILMORY PANSY 2ND" 91,219

Winner of President's Medal for best Ayrshire (Allot Show 1921) Bred by and the property of Mrs. Mary M. Alister, Morkle Kilmory, Buthaeny. Age six years and two months



Fig 41 CLYDESDALE MARI ' FLEUNSTANT LUYTENS

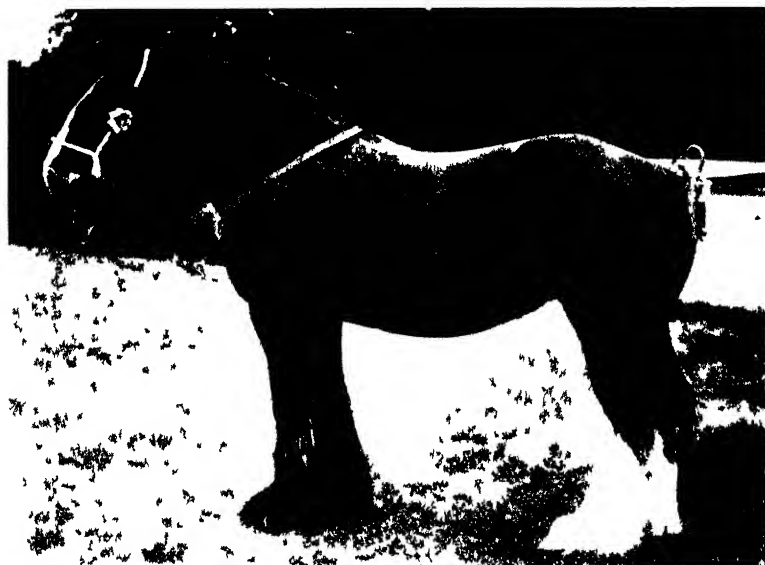
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Fig. 47.—SHINE MARK, LOCKIN + RIDGEWAY ROSE 119877

Winner - President's Medal for Best Show and All Show - The property of Mr A. J. H. Williams, 10, Llyn-y-farm, Huwau, Brikell Breilly, Meis W. C. & L. H.
- Rlets Grit Heil, after Welsh L. Martin, n. c. shire Age 1 years.



Fig 46 HUNTER GELDING GLENHOLM

Winner of President's Medal for best Hunter All (S) w 10 Bred by and the property of
 Sir John William Buchanan Bart of Castlehill But Castlehill Leith Age
 fifteen years and three months

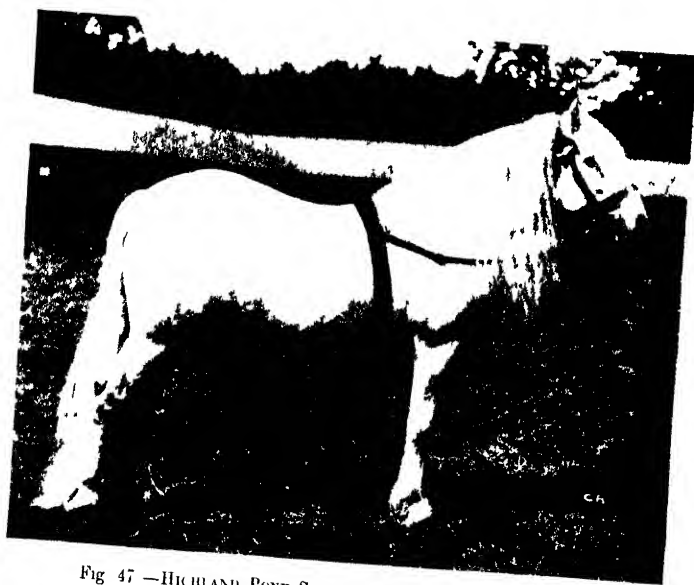


Fig 47 —HIGHLAND PONY STALLION, "GLENBRIARSDALE" 891

Winner of President's Medal for best Highland Pony Allon Show, 1901 The property of Mr
 J. Moncrieff Wright of Kinnonth Bridge of Earn Bred by Mr Kenneth MacDonald,
 Skeoch Isle of Skye Age fifteen years



Fig 70 MARE IN HARNESS "LASTERFRIDE" 1910S

Winner of President's Medal for best animal in the Class of Heavy Saddle Horses All a Show
 1910. The property of Mr William S Miller, Bournemouth, Castle Bridge, Exeter. Bred by
 Mr J F Twissall, Linton, Leicestershire. Age 12 years.



Fig. 51 — BLACKFACE TUP, "LOCKMASHIE"

Winner of President's Medal for best Blackface Sheep, All-England Show, 1921. Bred by and the property of Mr. M. G. Hamilton, Woolfrais, Coltham, Wiltshire.



Fig. 52 — CHEVIOT SHIRAZINE TUP

Winner of President's Medal for best Cheviot Sheep, All-England Show, 1929. Bred by and the property of Mr. George Hodgkinson, Grantsdale.

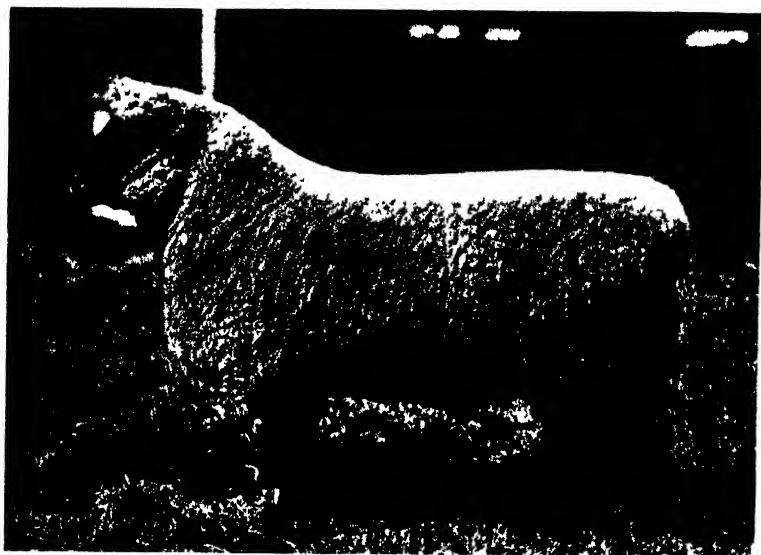


Fig. 55.—OXFORD-DOWN SHEARLING TUP.

Winner of President's Medal for best Oxford-Down Sheep, Allon Show, 1929. The property of Mr William I. Malcolm, Whittingeham Mains, Haddington. Bred by Messrs T. Rich & Son, Aldsworth, Cheltenham.

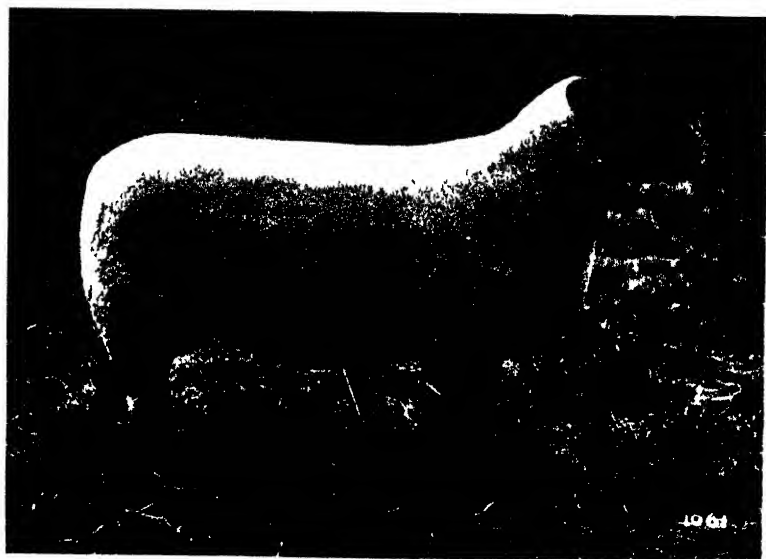


Fig. 56.—SUFFOLK SHEARLING EWE.

Winner of President's Medal for best Suffolk Sheep, Allon Show, 1929. Bred by and the property of Mr William G. Lightly, Whitelaw, Haddington.



Fig 57 —SHROPSHIRE SHEARLING TUP.

Winner of President's Medal for best Shropshire Sheep. Alloa Show, 1921. Bred by and the property of Mr Thomas A. Buttar, Corston, Coupar Angus.

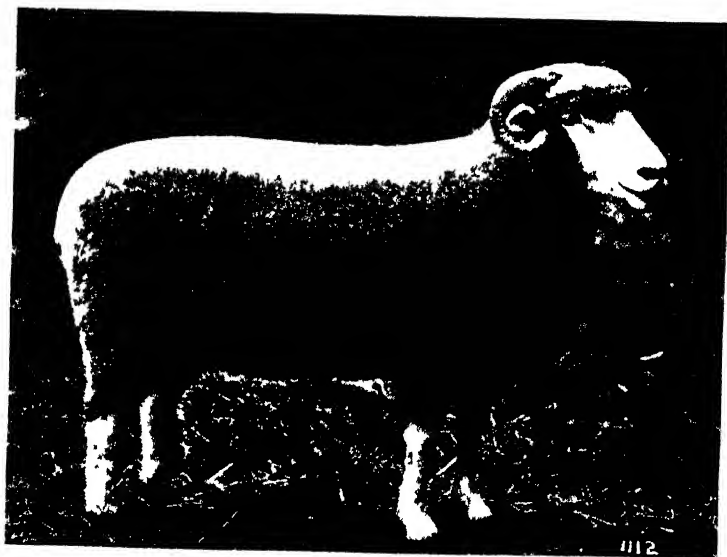


Fig 58 —DORSET HORN EWE 451

Winner of President's Medal for best Dorset Horn Sheep. Alloa Show 1929. Bred by and the property of The Earl of Fife and Kincaidine, C. M. G., Broomhall, Dunfermline. Age three years.



Fig. 59. BRITISH ALPINE MALE GOAT, DUFFIN ABDOSIED S692.

Winner of President's Medal for best animal in the Goat Class & All a Show, 192. Bred by and the property of Lady Fortviot, Duffin Castle, Perth. Age one year and two months.



Fig 60 —LARGE WHITE SOW, "PEAKIRK MARY 5TH" 160,150

Winner of President's Medal for best Large White Pig, Alcoa Show, 1929. The property of Lord Dunsbury, CVO, Wilton Hall, Warrington. Bred by Mr John Neaverson, The Chestnuts, Peakirk, Peterborough. Age three years and eleven months.

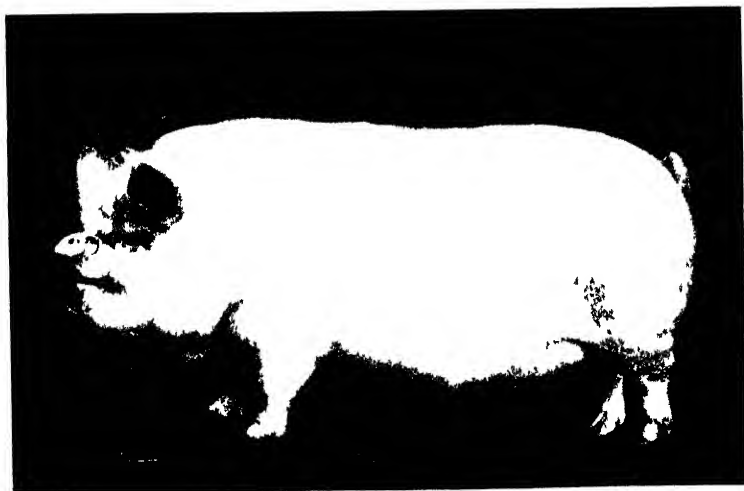


Fig 61 —MIDDLE WHITE SOW, "ASHTONHAYES MONARCH" 174,202.

Winner of President's Medal for best Middle White Pig, Alcoa Show, 1929. The property of Mr W Hallis, Bank House Farm, Holsty, Warrington. Bred by Mrs Linnet Johnson, Ashtonhayes, Cheshire. Age two years and six months.



Fig. 62.—LARGE BLACK SOW, "BAYDON NIGHTINGALE 52ND" E. 162.

Winner of President's Medal for best Large Black Pig, Allon Show, 1929. Bred by and the property of Mr. Walter Woolland, Baydon Manor, Ramsbury, Marlborough. Age one year and six months.

PREMIUMS AWARDED BY THE SOCIETY IN 1929.

ALLOA SHOW.

23rd, 24th, 25th, and 26th July 1929.

ABBREVIATIONS.—V., *Very Highly Commended*. H., *Highly Commended*.
C., *Commended*.

CATTLE.

SHORTHORN.

PRESIDENT'S CHAMPION MEDAL for Best Shorthorn.

No. 11 Marshall, Albert James, Bridgebank, Stranraer, "Bridgebank
Vulcan" (221,490).

Reserve—No. 56 Cameron, James, Balnakyle, Munlochy, Heifer,
"Balnakyle Symmetry 6th" (83,474).

The Duthie Perpetual Challenge Cup, value £150, for best animal in the
Shorthorn Classes, "Extra Stock" being eligible to compete. This
Cup was gifted by the late Mr William Duthie, Collynie.

No. 11 Marshall, Albert James, Bridgebank, Stranraer, "Bridgebank
Vulcan" (221,490).

Tweeddale Gold Medal for best *Shorthorn Bull*.—Annual free income
from fund of £500.

No. 11 Marshall, Albert James, Bridgebank, Stranraer, "Bridgebank
Vulcan" (221,490).

*Best Shorthorn Bull in the Show, entered or eligible for entry in Coates's Herd
Book*—£20, given by the Shorthorn Society.

No. 11 Marshall, Albert James, Bridgebank, Stranraer, "Bridgebank
Vulcan" (221,490).

Silver Medal to the Breeder of the winner of above Prize—given by the
Shorthorn Society.

No. 11 Marshall, Albert James, Bridgebank, Stranraer.

Breeder of best Bull of any age in Classes 1, 2, 3, 4, and 5—The Silver Medal.

No. 11 Marshall, Albert James, Bridgebank, Stranraer.

CLASS 1. BULL, born before 1st December, 1926.—
PREMIUMS, £15, £10, £5, and £3.

- 1st No. 1 Alexander & Addie, Newbiggin, Cambus, "Collynie Red King" (214,704).
 2nd No. 2 Douglas, George, Cadbollmount, Fearn, Ross-shire, "Aldie White Prince" (195,566).
 3rd No. 3 Fletcher, Captain A. M. Talbot, of Saltoun, Saltoun Hall, Pencaitland, East Lothian, "Saltoun Cruiser" (193,849).

CLASS 2. BULL, born on or after 1st December 1926 and before 1st April 1927.—PREMIUMS, £15, £10, £5, and £3.

- 1st No. 11 Marshall, Albert James, Bridgebank, Stranraer, "Bridgebank Vulcan" (221,490).
 2nd No. 8 Cameron, James, Balnakyle, Munloch, "Doune Buccaneer" (215,148).
 3rd No. 9 Keir & Cawder, Limited, Keir Home Farm, Dunblane, "Aldie Diamond" (220,442).
 4th No. 12 Marshall, Albert James, Bridgebank, Stranraer, "Bridgebank Airican" (221,346).
 V No. 10 Mackenzie, John, Balnain, Conon Bridge, "Royal Barrister" (226,166).
 H No. 13 Maxwell, David, Panlathy Mill, Carnoustie, "Aldie Nobleman" (220,445).

CLASS 3. BULL, born on or after 1st April 1927, and before 1st December 1927.—PREMIUMS, £12, £8, £4, and £2.

(Not forward).

CLASS 4. BULL, born on or after 1st December 1927, and before 1st April 1928.—PREMIUMS, £12, £8, £4, and £2.

- 1st No. 29 Marshall, Albert James, Bridgebank, Stranraer, "Cruggleton Patrician."
 2nd No. 26 MacWilliam, W. S., M.V.O., Garbity, Orton Station, Moray-shire, "Rosehaugh White Eagle."
 3rd No. 23 Jones, Messrs, Dunmore Park, Larbert, "Cluny Ian Augustus."
 4th No. 30 Middleton, F. A., Rosefarm, Cromarty, "Rosefarm Tor-eador."
 V No. 18 Baird, J., & Co. (Falkirk), Limited, Bantaskin, Falkirk, "Bantaskin Snow Prince" (220,857).
 H No. 28 Marshall, Albert James, Bridgebank, Stranraer, "Cruggleton Duke."
 C No. 19 Barr, John Fillans, Killineer House, Drogheda, Co. Louth, "Windmill Gladiator."
 C No. 25 M'William, R. S., Garguston, Muir of Ord, "Garguston Baronet."

CLASS 5. BULL, born on or after 1st April, 1928.—
PREMIUMS, £10, £6, £4, and £2.

The Emilio R. Casares, jun., "Junior Champion Cup," value £50, for best Shorthorn Bull in Class 5, calved on or after 1st April of the year preceding the Show, that has passed the tuberculin test. Given by Mr Emilio R. Casares, jun.

No. 32 Alexander & Addie, Newbiggin, Cambus, "Cambus Ingot,"
Reserve—No. 40 Fletcher, Captain A. M. Talbot, of Saltoun, Saltoun Hall, Pencaitland, East Lothian, "Saltoun Golden Dream."

- 1st No. 32 Alexander & Addie, Newbiggin, Cambus, "Cambus Ingot."
- 2nd No. 40 Fletcher, Captain A. M. Talbot, of Saltoun, Saltoun Hall, Pencaitland, East Lothian, "Saltoun Golden Dream."
- 3rd No. 45 Marshall, Albert James, Bridgebank, Stranraer, "Cruggleton Norseman."
- 4th No. 36 Baird, J., & Co. (Falkirk), Limited, Bantaskin, Falkirk, "Bantaskin Fairway."
- V No. 41 Fraser, Malcolm F., Culcairn, Atness, "Garguston Brave Archer."
- H No. 43 Jones, Messrs, Dunmore Park, Larbert, "Cluny Rosestock."
- C No. 31 Alexander & Addie, Newbiggin, Cambus, "Millbank Field-Marshal."
- C No. 34 Baird, J. & Co. (Falkirk), Limited, Bantaskin, Falkirk, "Balcairn Golden Chief."

Best Shorthorn Female in the Show, entered or eligible for entry in Coates's Herd-Book—£20, given by the Shorthorn Society.

No. 56 Cameron, James, Balnakyle, Munloch, Heifer, "Balnakyle Symmetry 6th" (83,474).

Silver Medal to the Breeder of the winner of above Prize—given by the Shorthorn Society.

No. 56 Cameron, James, Balnakyle, Munloch.

CLASS 6. COW, born before 1st December 1925, in Milk.
—PREMIUMS, £12, £8, £4, and £2.

- 1st No. 50 Graham, A. G. Maxtone, Redgorton, Perth, "Dorothy 16th" (36,844).
- 2nd No. 47 Alexander & Addie, Newbiggin, Cambus, "Lady Henrietta" (22,741).
- 3rd No. 48 Baird, J., & Co. (Falkirk), Limited, Bantaskin, Falkirk, "Throsk Princess Broadhooks 16th" (48,518).
- 4th No. 51 Meikle, Robert W., Bearcrofts, Grangemouth, "Eliza 40th" (64,984).
- V No. 49 Crawford and Balcarres, The Earl of, K.T., Balcarres, Colinsburgh, "Lady Margery" (72,282).

CLASS 7. COW, born on or after 1st December 1925, and before 1st December 1926.—PREMIUMS, £10, £5, £3, and £2.

- 1st No. 54 Houldsworth, Captain J. F. H., Coltness, Wishaw, "Coltness Missie" (86,833).
 2nd No. 53 Graham, A. G. Maxtone, Redgorton, Perth, "Dorothy 21st" (97,153).
 3rd No. 52 Baird, J., & Co. (Falkirk), Limited, Bantaskin, Falkirk, "Startforth Augusta 3rd" (86,292).

CLASS 8. COW or HEIFER, born on or after 1st December 1926, and before 1st December 1927.—PREMIUMS, £10, £5, £3, and £2.

- 1st No. 56 Cameron, James, Balnakyle, Munloch, Heifer, "Balnakyle Symmetry 6th" (83,474).
 2nd No. 57 Connon, Robert, Nether Coullie, Kemnay, Heifer, "Orange Laura" (95,414).
 3rd No. 60 Jones, Messrs, Dunmore Park, Larbert, Heifer, "Larbert Nonpareil 9th" (98,525).
 4th No. 59 Fletcher, Mrs, of Rosehaugh, Avoch, Ross-shire, Heifer, "Rosehaugh Broadhooks Maid" (96,724).
 V No. 58 Fletcher, Captain A. M. Talbot, of Saltoun, Saltoun Hall, Pencaitland, East Lothian, Heifer, "Saltoun Clara 3rd" (96,707).
 H No. 61 Snadden, W. M'Nair, Coldoch, Blair Drummond, Stirling, Heifer, "Coldoch Belladrum Flower 3rd" (102,134).

CLASS 9. HEIFER, born on or after 1st December 1927, and before 1st April 1928.—PREMIUMS, £10, £5, £3, and £2.

- 1st No. 70 M'William, R. S., Garguston, Muir of Ord, "Golden Iris."
 2nd No. 69 Jones, Messrs, Dunmore Park, Larbert, "Larbert Clipper 13th."
 3rd No. 71 Moray, The Earl of, Doune Lodge, Doune, "Moss Rose."
 4th No. 66 Fletcher, Captain A. M. Talbot, of Saltoun, Saltoun Hall, Pencaitland, East Lothian, "Saltoun Fairy Queen 2nd."
 V No. 64 Crawford and Balcarres, The Earl of, K.T., Balcarres, Colinsburgh, "Balcarres Joan."
 H No. 62 Butters, James, Masterton, Dunfermline, "Masterton Nonpareil 5th."
 C No. 68 Hunter, William C., of Arngask, Glenfarg, "Arngask Beauty 4th."

CLASS 10. HEIFER, born on or after 1st April 1928.—PREMIUMS, £10, £5, £3, and £2.

- 1st No. 72 Alexander & Addie, Newbiggin, Cambus, "Cambus Gwendoline."
 2nd No. 73 Alexander & Addie, Newbiggin, Cambus, "Cambus Orange Blossom 2nd."
 3rd No. 77 Moray, The Earl of, Doune Lodge, Doune, "Doune Clipper 19th."
 4th No. 75 Cameron, James, Balnakyle, Munloch, "Balnakyle Augusta 28th."
 V No. 76 Fletcher, Mrs, of Rosehaugh, Avoch, Ross-shire, "Rosehaugh Lavender 8th."
 H No. 74 Alexander & Addie, Newbiggin, Cambus, "Cambus Golden Drop."

ABERDEEN-ANGUS.

PRESIDENT'S CHAMPION MEDAL for best Aberdeen-Angus Animal.

No. 108 Grant, Sir George Macpherson, Bart., Ballindalloch Home Farms, Ballindalloch, "Roseleaf of Ballindalloch" (74,176).

Reserve—No. 82 Kerr, J. E., of Harviestoun, Dollar, "Jipsey Eric" (62,088).

Silver Cup, value £50, for best Group of Aberdeen-Angus Cattle, consisting of one Bull and two Females, "Extra Stock" being eligible to compete. Given by Mr W. Gilchrist Macbeth of Dunira, Comrie.

Nos. 82, 126, and 150 Kerr, J. E., of Harviestoun, Dollar.

Ballindalloch Challenge Cup, value £50, for the best Bull of any age in Classes 11, 12, 13, and 14, given by the late Sir George Macpherson Grant, Bart.

No. 82 Kerr, J. E., of Harviestoun, Dollar, "Jipsey Eric" (62,088).

Breeder of best Bull of any age in Classes 11, 12, 13, and 14—The Silver Medal.

No. 82 Kerr, J. E., of Harviestoun, Dollar.

Exhibitor of the winner of the Ballindalloch Challenge Cup—The Silver Medal.

No. 82 Kerr, J. E., of Harviestoun, Dollar.

Breeder (if not also the Exhibitor) of the winner of the Ballindalloch Challenge Cup—The Silver Medal.

(Not awarded).

Champion Gold Medal for best animal in the Breeding Classes, Breeding Animals shown as "Extra Stock" being eligible to compete—given by the Aberdeen-Angus Cattle Society.

No. 108 Grant, Sir George Macpherson, Bart., Ballindalloch Home Farms, Ballindalloch, "Roseleaf of Ballindalloch" (74,176).

CLASS 11. BULL, born before 1st December 1926.—
PREMIUMS, £15, £10, £5, and £3.

1st No. 82 Kerr, J. E., of Harviestoun, Dollar, "Jipsey Eric" (62,088).

2nd No. 80 Cridlan, J. J., Maisemore Park, Gloucester, "Prince Evade of Maisemore" (57,854).

3rd No. 83 Petrie, John M'G., Mains of Asleid, New Deer, "Mulben Bulletin" (59,917).

4th No. 84 Reid, Andrew Thomson, Auchterarder House, Auchterarder, "Bushranger of Gallovie" (58,591).

V No. 78 Allan, John M., Easter Duthil, Carr Bridge, "Hallmark of Milford" (59,523).

H No. 85 Stewart, John, Woodburne, Ceres, Cupar, Fife, "Ruler of Dunira" (60,370).

C No. 81 Elgin and Kincardine, The Earl of, C.M.G., Broomhall, Dunfermline, "Enthraller of Lochbank" (61,443).

CLASS 12. BULL, born on or after 1st December 1926, and before 1st December 1927.—PREMIUMS, £15, £10, £5, and £3.

- 1st No. 89 Mackay, Charles, Balnastraid, Carr Bridge, "Black Mahdi of Bleaton" (63,433).
 2nd No. 90 Prince-Smith, Sir Prince, Bart., Southburn House, Driffeld, Yorkshire, "Judas of Southburn" (67,880).
 3rd No. 87 Goodson, Captain A. L., Kilham, Mindrum, Northumberland, "Kythe of Dunira" (64,963).
 4th No. 86 Allendale, Viscount, Dilston, Corbridge-on-Tyne, "Elver of Bywell" (64,074).
 V No. 88 Haig, Colonel Robert, Dollarfield, Dollar, "Merlyn of Doonholm" (65,078).
 H No. 91 Stewart, John W., Broadmeadows House, Hutton, Berwick-on-Tweed, "Evander of Abergeldie" (64,350).

CLASS 13. BULL, born on or after 1st December 1927, and before 1st March 1928.—PREMIUMS, £12, £8, £4, and £2.

- 1st No. 94 Donaldson, Norman P., C.B.E., Ballindalloch, Balfroun, "Elixir of Derculich" (66,966).
 2nd No. 97 Russell, G. H., of The Burn, Edzell, "Benefactor of Castlecraig" (66,211).
 3rd No. 96 Petrie, John M'G., Mains of Asleid, New Deer, "Janitor of Kinermony" (67,779).
 4th No. 92 Allan, John M., Easter Duthil, Carr Bridge, "Evoy of Tomlunquhart" (67,445).
 V No. 98 Stewart, John, Woodburne, Ceres, Cupar, Fife, "Menelaus of Doonholm" (68,164).
 H No. 95 Elliot, David P., Nisbethill, Duns, "Euron of Nisbethill" (67,337).
 C No. 93 Buchanan, James, Milton, Doune, "Rustic of Kinermony" (68,897).

CLASS 14. BULL, born on or after 1st March 1928.—PREMIUMS, £10, £6, £4, and £2.

- 1st No. 103 Lilburn, Lieut.-Colonel W., of Coull, Coull House, Aboyne, "Master Bingham of Doonholm" (68,142).
 2nd No. 104 Murray, Thomas, & Sons, Laigh Grange, Maybole, "Ganymede of Laigh Grange" (67,551).
 3rd No. 100 Elliot, David P., Nisbethill, Duns, "Hillman of Nisbethill" (67,714).
 4th No. 101 Howison, A. W., Lochbank, Blairgowrie, "Lochbank Babler" (68,041).
 V No. 105 Waddell, James D., Clury, Grantown-on-Spey, "Equidad of Clury" (67,134).
 H No. 99 Beddie, James, Banks, Strichen, "Gaffer Gideon" (67,532).
 C No. 102 Kennedy, Colonel Norman, D.S.O., of Doonholm, Ayr, "Eskimo of Doonholm" (67,267).

Silver Cup, value £50, for the best Female animal of the *Aberdeen-Angus* breed, "Extra Stock" being eligible to compete. Presented by Mr Falconer L. Wallace of Candacraig and Balcairn, Strathdon.

- No. 108 Grant, Sir George Macpherson, Bart., Ballindalloch Home Farms, Ballindalloch, "Roseleaf of Ballindalloch" (74,176).

Ballindalloch Challenge Cup, value £50, for the best Cow of any age in Classes 15, 16, and 17, given by the late Sir John Macpherson Grant, Bart.

No. 108 Grant, Sir George Macpherson, Bart., Ballindalloch Home Farms, Ballindalloch, "Roseleaf of Ballindalloch" (74,176).

Exhibitor of the Winner of the Ballindalloch Challenge Cup—The Silver Medal.

No. 108 Grant, Sir George Macpherson, Bart., Ballindalloch Home Farms, Ballindalloch.

Breeder (if not also the Exhibitor) of the Winner of the Ballindalloch Challenge Cup—The Silver Medal.

(Not awarded).

CLASS 15. COW, in Milk, born before 1st December 1925.
—PREMIUMS, £12, £8, £4, and £2.

- 1st No. 108 Grant, Sir George Macpherson, Bart., Ballindalloch Home Farms, Ballindalloch, "Roseleaf of Ballindalloch" (74,176).
2nd No. 110 Kennedy, Colonel Norman, D.S.O., of Doonholm, Ayr, "Bettina of Doonholm" (78,885).
3rd No. 107 Dalgleish, James P., of Westgrange, Newmills, Dunfermline, "Julia of Grange" (76,151).
4th No. 106 Beddie, James, Banks, Strichen, "Gammer Jerome" (75,764).
V No. 109 Grant, Sir George Macpherson, Bart., Ballindalloch Home Farms, Ballindalloch, "Evelusine of Ballindalloch" (76,417).
H No. 111 Marshall & Mitchell, Bleaton, Blairgowrie, "Empress Elect of Bleaton" (72,354).

EXTRA STOCK.

The following was awarded the Silver Medal:—

No. 113 Kennedy, Colonel Norman, D.S.O., of Doonholm, Ayr, "Elmina of Doonholm" (76,615).

CLASS 16. COW, in Milk, born on or after 1st December 1925, and before 1st December 1926.—PREMIUMS, £12, £8, £4, and £2.

- 1st No. 116 Kennedy, Colonel Norman, D.S.O., of Doonholm, Ayr, "Madeira of Doonholm" (81,393).
2nd No. 115 Grant, Sir George Macpherson, Bart., Ballindalloch Home Farms, Ballindalloch, "Joan of Ballindalloch" (81,146).
3rd No. 114 Cran, George, Morlich, Glenkindie, "Elkara of Morlich" (80,711).
4th No. 117 Kerr, J. E., of Harviestoun, Dollar, "Judy Erica" (81,416).
V No. 119 Rottenburg, F. A., Lochlane, Crieff, "Malaya of Doonholm" (81,394).
H No. 112 Thomson, Ian K., Burgie House, Forres, "Janet of Burgie" (82,544).
C No. 118 Montrose, The Duke of, C.B., C.V.O., Buchanan Castle, Drymen, "Easy Etta 2nd of West Newton" (80,750).

CLASS 17. COW or HEIFER, born on or after 1st December 1926, and before 1st December 1927.—PREMIUMS, £10, £5, £3, and £2.

- 1st No. 126 Kerr, J. E., of Harviestoun, Dollar, Heifer, " Jimpy Erica " (84,225).
 2nd No. 121 Elliot, David P., Nisbethill, Duns, Heifer, " Heatherberry of Nisbethill " (83,637).
 3rd No. 127 Lilburn, Lieut.-Colonel W., of Coull, Coull House, Aboyne, Heifer, " Elinore of Coull " (84,341).
 4th No. 125 Kennedy, Colonel Norman, D.S.O., of Doonholm, Ayr, Heifer, " Bryony of Doonholm " (84,198).
 V No. 123 Honeyman, R. Wemyss, Derculich, Strathtay, Heifer, " Black Lula of Skillymarno " (83,957).
 H No. 124 Honeyman, R. Wemyss, Derculich, Strathtay, Heifer, " Romata of Ballindalloch " (83,914).
 C No. 129 Stewart, John, Woodburne, Ceres, Cupar, Fife, Heifer, " Black Eyes of Woodburne " (85,380).

CLASS 18. HEIFER, born on or after 1st December 1927, and before 1st March 1928.—PREMIUMS, £10, £5, £3, and £2.

- 1st No. 133 Elliot, David P., Nisbethill, Duns, " Gertrude of Nisbethill " (86,697).
 2nd No. 139 Macbeth, W. Gilchrist, of Dunira, Comrie, " Pride 3rd of Dunira " (87,491).
 3rd No. 130 Beddie, James, Banks, Strichen, " Gammer Ebena " (86,035).
 4th No. 135 Honeyman, R. Wemyss, Derculich, Strathtay, " Beryl 2nd of Derculich " (87,185).
 V No. 146 Rottenburg, F. A., Lochlane, Cricff, " Erma 2nd of Balfroon " (86,553).
 H No. 131 Beddie, James, Banks, Strichen, " Becharming Maid of Banks " (86,026).
 C No. 132 Donaldson, Norman P., C.B.E., Ballindalloch, Balfroon, " Ellery of Balfroon " (86,551).
 C No. 143 Reid, Andrew Thomson, Auchterarder House, Auchterarder, " Princess Royal of Nisbethill " (86,705).

CLASS 19. HEIFER, born on or after 1st March 1928.—PREMIUMS, £10, £5, £3, and £2.

- 1st No. 148 Allendale, Viscount, Dilston, Corbridge-on-Tyne, " Elyana of Bywell " (85,928).
 2nd No. 150 Kerr, J. E., of Harviestoun, Dollar, " Evelex of Harviestoun " (87,329).
 3rd No. 152 Robertson, Charles G., Tullochgribban, Grantown-on-Spey, " Queenie of Tullochgribban " (88,215).
 4th No. 151 Macbeth, W. Gilchrist, of Dunira, Comrie, " Jenny 3rd of Dunira " (87,486).
 V No. 155 Taylor, J. P. Ross, Mungoswalls, Duns, " Mungos Elina 2nd."

GALLOWAY.

PRESIDENT'S MEDAL for best Galloway.

No. 170 Wilson, James, & Son, Tundergarth Mains, Lockerbie, "Ewanston Aster" (28,529).

Reserve—No. 183 Buccleuch and Queensberry, The Duke of, K.T., Drumlanrig Castle, Thornhill, Dumfriesshire, "Angelica of Drumlanrig" (31,974).

Dr Gillespie Memorial Challenge Trophy, value £50, *for best Galloway Animal registered in the Galloway Cattle Society's Herd-Book, entered in any of the Breeding Classes, Breeding Animals shown as "Extra Stock" being eligible to compete*—given by the Galloway Cattle Society of Great Britain and Ireland.

No. 170 Wilson, James, & Son, Tundergarth Mains, Lockerbie, "Ewanston Aster" (28,529).

Breeder of best Bull of any age in Classes 20, 21, and 22—The Silver Medal.

No. 156 Young, Arthur, Garroch House, Dalry.

CLASS 20. BULL, born before 1st December 1926.

—PREMIUMS, £15, £10, £5, and £3.

1st No. 156 Buchanan-Jardine, Sir John William, of Castlemilk, Bart., Castlemilk, Lockerbie, "Warfare of Waterside" (15,721).

2nd No. 157 Graham, Robert, Chapel of Logan, Canonbie, "Grange Beau Brocade" (14,649).

3rd No. 160 Malcolm, George, Dalwyne, Barr, Ayrshire, "Something Good" (16,349).

CLASS 21. BULL, born on or after 1st December 1926, and before 1st December 1927.—PREMIUMS, £15, £10, £5, and £3.

1st No. 161 Biggar, Walter, Grange Farm, Dalbeattie, "Grange Hussar" (16,394).

CLASS 22. BULL, born on or after 1st December 1927.

—PREMIUMS, £12, £8, £4, and £2.

1st No. 164 Graham, Robert, Chapel of Logan, Canonbie, "Turcan of Beechwood" (17,020).

2nd No. 162 Buchanan-Jardine, Sir John William, of Castlemilk, Bart., Castlemilk, Lockerbie, "Regulator of Whitehill" (17,033).

3rd No. 163 Gillett, Arnold, of Crawfordton, Moniaive, "Footprint of Blair" (16,799).

4th No. 165 Wilson, James, & Son, Tundergarth Mains, Lockerbie, "Royal Lad of Tundergarth Mains" (17,213).

CLASS 23. COW, of any age in Milk.—PREMIUMS.
£12, £8, £4, and £2.

- 1st No. 170 Wilson, James, & Son, Tundergarth Mains, Lockerbie, "Ewanston Aster" (28,529).
 2nd No. 166 Buchanan-Jardine, Sir John William, of Castlemilk, Bart., Castlemilk, Lockerbie, "Ivy of Mossknowe" (28,896).
 3rd No. 168 Paterson, R. Jardine, Balgray, Lockerbie, "Frisky of Mossknowe" (28,377).
 4th No. 167 Graham, Robert, Chapel of Logan, Canonbie, "Logan Lady 16th" (30,270).
 V No. 169 Paterson, R. Jardine, Balgray, Lockerbie, "Bell 3rd of Askerton" (30,292).

CLASS 24. COW or HEIFER, born on or after 1st December 1926, and before 1st December 1927.—PREMIUMS, £10, £5, £3, and £2.

- 1st No. 172 Biggar, Walter, Grange Farm, Dalbeattie, Heifer, "Portia of Auchineden" (31,353).
 2nd No. 181 Wilson, James, & Son, Tundergarth Mains, Lockerbie, Heifer, "Lady Alice 11th" (31,858).
 3rd No. 178 Paterson, R. Jardine, Balgray, Lockerbie, Heifer, "Joan 3rd of Balgray" (31,533).
 4th No. 177 Gourlay, Francis N. M., Kirkland, Tynron, Thornhill, Dumfries-shire, Heifer, "Favourite of Kirkland" (31,435).
 V No. 174 Buchanan-Jardine, Sir John William, of Castlemilk, Bart., Castlemilk, Lockerbie, Heifer, "Lilith 3rd of Castlemilk" (31,521).
 H No. 179 Paterson, R. Jardine, Balgray, Lockerbie, Heifer, "Doris 2nd of Balgray" (31,534).
 C No. 180 Wilson, James, & Son, Tundergarth Mains, Lockerbie, Heifer, "Jessie 6th" (31,854).
 C No. 176 Gourlay, Francis N. M., Kirkland, Tynron, Thornhill, Dumfries-shire, Heifer, "Countess of Kirkland" (31,433).

CLASS 25. HEIFER, born on or after 1st December 1927.—PREMIUMS, £10, £5, £3, and £2.

- 1st No. 183 Buccleuch and Queensberry, The Duke of, K.T., Drumlanrig Castle, Thornhill, Dumfries-shire, "Angelica of Drumlanrig" (31,974).
 2nd No. 185 Buchanan-Jardine, Sir John William, of Castlemilk, Bart., Castlemilk, Lockerbie, "Lilith 4th of Castlemilk" (32,237).
 3rd No. 189 Jeffrey, C., Kirtleton, Waterbeck, Lockerbie, "Kirtleton Bonnie Jean" (32,252).
 4th No. 182 Buccleuch and Queensberry, The Duke of, K.T., Drumlanrig Castle, Thornhill, Dumfries-shire, "Pimpernel of Drumlanrig" (31,973).
 V No. 192 Paterson, R. Jardine, Balgray, Lockerbie, "Gratitude of Balgray" (32,246).
 H No. 190 Jeffrey, C., Kirtleton, Waterbeck, Lockerbie, "Kirtleton Susan 2nd" (32,254).
 C No. 186 Gillett, Arnold, of Crawfordton, Moniaive, "Nan of Castlemilk" (32,232).
 C No. 193 Paterson, R. Jardine, Balgray, Lockerbie, "Petunia 1st of Balgray" (32,248).
 C No. 187 Gourlay, Francis N. M., Kirkland, Tynron, Thornhill, Dumfries-shire, "Lady Stanley of Kirkland" (32,154).
 C No. 188 Gourlay, Francis N. M., Kirkland, Tynron, Thornhill, Dumfries-shire, "Gaiety of Kirkland" (32,157).

BELTED GALLOWAY.*PRESIDENT'S CHAMPION MEDAL for best Belted Galloway Animal.*

No. 214 Cayzer, Lieut.-Commander Sir August, Bart., R.N., Gartmore House, Gartmore, "Gartmore Helen 1st" (1322 B).

Reserve—No. 197 Hamilton, General Sir Ian, 1 Hyde Park Gardens, London, "Allington Concrete" (467 B).

Knockbrex Challenge Cup, value £50, *for the best Belted Galloway Animal, "Extra Stock"* being eligible to compete. This Cup was presented by Mrs Brown, Kirkbrex, Glasgow, for the best Belted Galloway animal registered in the Dun and Belted Galloway Cattle Breeders' Association Herd-Book, entered in any of the breeding classes, at the Show at which it may be competed for.

No. 214 Cayzer, Lieut.-Commander Sir August, Bart., R.N., Gartmore House, Gartmore, "Gartmore Helen 1st" (1322 B).

CLASS 26. BULL, born before 1st December 1927.

—PREMIUMS, £10, £5, £3, and £2.

1st No. 197 Hamilton, General Sir Ian, 1 Hyde Park Gardens, London, "Allington Concrete" (467 B).

2nd No. 196 Cayzer, Lieut.-Commander Sir August, Bart., R.N., Gartmore House, Gartmore, "Gartmore Robin" (707 B).

3rd No. 194 Bullough, Major Ian, Drury Lane Farm, Redmarley, Newent, Gloucester, "Shenley Aristocrate" (797 B).

4th No. 105 Bute, The Marquis of, K.T., Craigeach, Kirkcowan, "Mark Grant" (655 B).

V No. 198 Hamilton, General Sir Ian, 1 Hyde Park Gardens, London, "Lullenden Falstaff" (697 B).

CLASS 27. BULL, born on or after 1st December 1927.

—PREMIUMS, £10, £5, £3, and £2.

1st No. 200 Bute, The Marquis of, K.T., Craigeach, Kirkcowan, "Mochrum Majestic of Craigeach" (769 B).

2nd No. 201 Cayzer, Lieut.-Commander Sir August, Bart., R.N., Gartmore House, Gartmore, "Gartmore Nigel" (839 B).

3rd No. 203 Cross, Sir William, Bart., of Scatwell, Muir of Ord, "Scatwell Colonel" (865 B).

4th No. 204 Hamilton, General Sir Ian, 1 Hyde Park Gardens, London, "Lullenden Douglas 2nd."

V No. 199 Brown, J. Douglas, Corseyard, Kirkcudbright, "Knockbrex Faust" (819 B).

C No. 202 Cross, Sir William, Bart., of Scatwell, Muir of Ord, "Gartmore Edward" (837 B).

CLASS 28. COW or HEIFER, born before 1st December 1926, in Milk or in Calf; if in Calf and not in Milk, to calve on or before 1st December of the year of the Show.—PREMIUMS, £10, £5, £3, and £2.

- 1st No. 207 Cayzer, Lieut.-Commander Sir August, Bart., R.N., Gartmore House, Gartmore, Cow, "Gartmore Mary 2nd" (1038 B).
 2nd No. 208 Cross, Sir William, Bart., of Scatwell, Muir of Ord, Cow, "Scatwell Cherry" (1106 B).
 3rd No. 206 Brown, J. Douglas, Corseyard, Kirkcudbright, Cow, "Knockbrex Donna" (974 B) (D).
 4th No. 205 Brown, J. Douglas, Corseyard, Kirkcudbright, Cow, "Knockbrex Catherine" (346 B).
 V No. 209 Hamilton, General Sir Ian, 1 Hyde Park Gardens, London, Cow, "Allington Rose 2nd" (502 B).

EXTRA STOCK.

The following was awarded the Silver Medal:—

- No. 210 Brown, J. Douglas, Corseyard, Kirkcudbright, Cow, "Knockbrex Claire" (762 B).

CLASS 29. HEIFER, born on or after 1st December 1926, and before 1st December 1927.—PREMIUMS, £10, £5, £3, and £2.

- 1st No. 214 Cayzer, Lieut.-Commander Sir August, Bart., R.N., Gartmore House, Gartmore, "Gartmore Helen 1st" (1322 B).
 2nd No. 211 Brown, J. Douglas, Corseyard, Kirkcudbright, "Knockbrex Eve" (1296 B).
 3rd No. 212 Brown, J. Douglas, Corseyard, Kirkcudbright, "Knockbrex Echo" (1280 B).
 4th No. 215 Hamilton, General Sir Ian, 1 Hyde Park Gardens, London, "Gartmore Lily 2nd" (1326 B).
 V No. 213 Bullough, Major Ian, Drury Lane Farm, Redmarley, Newent, Gloucester, "Redmarley Spruce" (1406 B).

CLASS 30. HEIFER, born on or after 1st December 1927.—PREMIUMS, £10, £5, £3, and £2.

- 1st No. 217 Brown, J. Douglas, Corseyard, Kirkcudbright, "Knockbrex Fleur-de-Lys" (1596 B) (D).
 2nd No. 220 Cross, Sir William, Bart., of Scatwell, Muir of Ord, "Scatwell Lady Luck" (1656 B).
 3rd No. 218 Bullough, Major Ian, Drury Lane Farm, Redmarley, Newent, Gloucester, "Redmarley Pine" (1404 B).
 4th No. 219 Cayzer, Lieut.-Commander Sir August, Bart., R.N., Gartmore House, Gartmore, "Gartmore Heather 7th" (1618 B).
 V No. 221 Cross, Sir William, Bart., of Scatwell, Muir of Ord, "Scatwell Laurel" (1658 B).
 H No. 222 Hamilton, General Sir Ian, 1 Hyde Park Gardens, London, "Lullenden Janet 2nd."
 C No. 216 Brown, J. Douglas, Corseyard, Kirkcudbright, "Knockbrex Fairy" (1586 B).

HIGHLAND.

PRESIDENT'S CHAMPION MEDAL for best Highland Animal.

No. 227 Maze, Mrs M., of Achnacloich, Connel, Argyll, "Culnadalloch II. of Achnacloich" (3441).

Reserve—No. 240 Southesk, The Earl of, Kinnaird Castle, Brechin, "Sidonia of Southesk" (9827).

Perpetual Victory Challenge Cup, approximate value 50 Guineas, *for the best animal in the Male Classes, "Extra Stock" being eligible to compete*—given by the Highland Cattle Society of Scotland.

No. 227 Maze, Mrs M., of Achnacloich, Connel, Argyll, "Culnadalloch II. of Achnacloich" (3441).

Breeder of best Bull of any age in Classes 31, 32, and 33—The Silver Medal.

No. 227 Maze, Mrs M., of Achnacloich, Connel, Argyll.

CLASS 31. BULL, born before 1927.—PREMIUMS,
£15, £10, £5, and £3.

1st No. 223 Stewart, John, Bochastle, Callander, "Prionnsa Ard of Kilberry" (3496).

CLASS 32. BULL, born in 1927.—PREMIUMS,
£15, £10, £5, and £3.

1st No. 227 Maze, Mrs M., of Achnacloich, Connel, Argyll, "Culnadalloch II. of Achnacloich" (3441).

2nd No. 226 M'Douall, A. Kenneth, of Logan, Stranraer, "Earl Haig of Logan."

3rd No. 225 Lees-Milne, Alec M., Knock House, Gruline, Isle of Mull, "An Gillie Siobhalt" (3520).

4th No. 228 Southesk, The Earl of, Kinnaird Castle, Brechin, "Calum Buidhe of Southesk."

V No. 224 Dunlop, Miss, Shieldhill, Biggar, "Niall Ruadh of Fanans" (3525).

CLASS 33. BULL, born in 1928.—PREMIUMS,
£12, £8, £4, and £2.

1st No. 231 Southesk, The Earl of, Kinnaird Castle, Brechin, "Carrington VI."

2nd No. 229 Maze, Mrs M., of Achnacloich, Connel, Argyll, "Clais Dhearg" (3553).

3rd No. 230 Southesk, The Earl of, Kinnaird Castle, Brechin, "Ossian V. of Southesk."

Perpetual Victory Challenge Cup, approximate value 35 Guineas, *for the best animal in the Female Classes, "Extra Stock" being eligible to compete*—given by the Highland Cattle Society of Scotland.

No. 240 Southesk, The Earl of, Kinnaird Castle, Brechin, "Sidonia of Southesk" (9827).

**CLASS 34. COW, of any age, in Milk.—PREMIUMS,
£12, £8, £4, and £2.**

- 1st No. 240 Southesk, The Earl of, Kinnaird Castle, Brechin, "Sidonia of Southesk" (9827).
 2nd No. 239 Southesk, The Earl of, Kinnaird Castle, Brechin, "Cornelia of Southesk" (9826).
 3rd No. 232 Carnegie, Mrs, of Stronvar, Strathyre, "Lady Alma" (10,149).
 4th No. 233 Carnegie, Mrs, of Stronvar, Strathyre, "Emily Dubh of Stronvar" (9978).
 V No. 238 Maitland, Brig.-General J. D. Heriot, C.M.G., D.S.O., of Errol, Errol Park, Errol, "Shuna III. of Errol" (9570).
 H No. 237 Maitland, Brig.-General J. D. Heriot, C.M.G., D.S.O., of Errol, Errol Park, Errol, "Fuinary Queen II. of Errol" (9567).

**CLASS 35. COW or HEIFER, born in 1926.—PREMIUMS,
£10, £5, £3, and £2.**

- 1st No. 242 Southesk, The Earl of, Kinnaird Castle, Brechin, Heifer, "Caroline II. of Southesk."
 2nd No. 241 Home, The Earl of, Douglas Castle, Douglas, Lanarkshire, Heifer, "Dossan Ruadh" (9721).

CLASS 36. HEIFER, born in 1927.—PREMIUMS, £10, £5, £3, and £2.

- 1st No. 246 Southesk, The Earl of, Kinnaird Castle, Brechin, "Maura of Southesk."
 2nd No. 244 Maitland, Brig.-General J. D. Heriot, C.M.G., D.S.O., of Errol, Errol Park, Errol, "Fuinary Princess II. of Errol."
 3rd No. 243 Maitland, Brig.-General J. D. Heriot, C.M.G., D.S.O., of Errol, Errol Park, Errol, "Lydia II. of Errol."
 4th No. 245 Maze, Mrs M., of Achnacloich, Connel, Argyll, "Capleadh IX. of Achnacloich" (10,150).
 V No. 247 Southesk, The Earl of, Kinnaird Castle, Brechin, "Caroline III. of Southesk."

CLASS 37. HEIFER, born in 1928.—PREMIUMS, £10, £5, £3, and £2.

- 1st No. 252 Southesk, The Earl of, Kinnaird Castle, Brechin, "Maura II. of Southesk,"
 2nd No. 253 Southesk, The Earl of, Kinnaird Castle, Brechin, "Caroline IV. of Southesk."
 3rd No. 250 Maitland, Brig.-General J. D. Heriot, C.M.G., D.S.O., of Errol, Errol Park, Errol, "Shuna V. of Errol."
 4th No. 254 Stewart, John, Bochastle, Callander, "Annag Bhuidhe VII." (10,063).
 V No. 251 Maitland, Brig.-General J. D. Heriot, C.M.G., D.S.O., of Errol, Errol Park, Errol, "Rosa of Errol."
 H No. 248 Home, The Earl of, Douglas Castle, Douglas, Lanarkshire, "An-t-Uramach Pride."
 C No. 255 Stewart, John, Bochastle, Callander, "Proiseag Dubh of Coilantogle" (10,062).

AYRSHIRE.

CONDITIONS.

1. To be eligible for competition in the Ayrshire Section cows must have an authenticated milk yield, and younger females (including cows which have not completed their first lactation) and bulls an authenticated milking pedigree, of a definite minimum amount.
2. The minimum amount referred to shall be as follows, calculated on the basis of a period between calvings of 52 weeks, and 3.8 per cent. of butter fat:—
 - (a) Cows which have completed two or more lactations—700 gallons.
 - (b) Cows which have completed only one lactation—600 gallons.
 - (c) Younger females and bulls—an authenticated milking pedigree for dam and dam of sire on a similar basis.
3. In the case of cows with two or more lactations the record lodged may be that for any year the Exhibitor may select.

PRESIDENT'S CHAMPION MEDAL for best Ayrshire.

No. 264 M'Alister, Mrs Mary, Meikle Kilmory, Rothesay, "Meikle Kilmory Pansy 2nd" (91,249).

Reserve—No. 289 Cochrane, Alexander, Nether Craig, Kilmarnock "Nether Craig Water Lily" (11,432).

Renfrewshire Perpetual Gold Challenge Cup, value £250, for best Ayrshire animal, "*Extra Stock*" being eligible to compete. This Cup, along with an endowment of £500, was provided from money collected in Renfrewshire by the late Provost Muir MacKean of Paisley, and is in commemoration of the Society's first Show in the county of Renfrew in 1913.

No. 264 M'Alister, Mrs Mary, Meikle Kilmory, Rothesay, "Meikle Kilmory Pansy 2nd" (91,249).

Reserve—No. 289 Cochrane, Alexander, Nether Craig, Kilmarnock, "Nether Craig Water Lily" (11,432).

Cowhill Champion Cup, approximate value £30, for best animal of the Ayrshire breed, entered with a number in the Herd-Book. Presented by the late Major Henry Keswick, Cowhill Tower, Dumfries, to the Ayrshire Cattle Herd-Book Society, to be competed for annually at the Shows of the Highland and Agricultural Society of Scotland.

No. 264 M'Alister, Mrs Mary, Meikle Kilmory, Rothesay, "Meikle Kilmory Pansy 2nd" (91,249).

Special Prizes of £7, £5, and £2 for Cows from Grade "A" (*Tuberculin Tested*) or *Certified Herds* drawn from Classes 38, 39, and 40. Given by Messrs Brown & Polson, Limited, Paisley, the Hon. T. G. P Corbett, Mr Alexander Munro, and Mr W. P. Gilmour.

1st No. 276 Corbett, The Hon. T. G. P., Rowallan, Kilmarnock, "Rowallan Bess" (89,834).

2nd No. 273 Corbett, The Hon. T. G. P., Rowallan, Kilmarnock, "Rowallan Kate Mendel 6th" (19,148).

3rd No. 275 Corbett, The Hon. T. G. P., Rowallan, Kilmarnock, "Auchenbrain Yellow Kate 12th" (54,219).

Special Prize of £10 for the best Female Animal of the Ayrshire breed entered with a number in the Ayrshire Cattle Herd-Book not later than 1st June 1929—given by the Ayrshire Cattle Herd-Book Society.

No. 264 M'Alister, Mrs Mary, Meikle Kilmory, Rothesay, "Meikle Kilmory Pansy 2nd" (91,249).

CLASS 38. COW in Milk, born before 1926.—PREMIUMS, £12, £8, and £4.

1st No. 264 M'Alister, Mrs Mary, Meikle Kilmory, Rothesay, "Meikle Kilmory Pansy 2nd" (91,249).

2nd No. 262 Ferguson, William L., Cairnweil, Sandhead, Stranraer, "Catlinns Pearl" (90,190).

3rd No. 257 Barr, Thomas, Hobsland, Monkton, "Hobsland Janet 2nd" (95,026).

V No. 258 Blair, William C., Dykehead, Busby, "East Glenshinnoch Annie" (67,638).

H No. 265 Mitchell, W. Ashby, Balbeuchly Home Farm, Dundee, "Cowhill Fortune 2nd" (2658).

CLASS 39. COW in Milk, born on or after 1st January 1926.

—PREMIUMS, £10, £7, and £3.

1st No. 271 Clark Brothers, Fingart Farm, Dunlop, "Fingart Hilda 2nd" (8643).

2nd No. 273 Corbett, The Hon. T. G. P., Rowallan, Kilmarnock, "Rowallan Kate Mendel 6th" (19,148).

3rd No. 269 Barr, Thomas, Hobsland, Monkton, "Hobsland Janet 3rd" (10,749).

CLASS 40. COW of any age, in Calf, and due to calve before 1st December of the year of the Show.—PREMIUMS, £10, £7, and £3.

1st No. 263 Howie, Robert, Flatterton Farm, Inverkip, "Clachan Dandie 4th" (86,077).

2nd No. 276 Corbett, The Hon. T. G. P., Rowallan, Kilmarnock, "Rowallan Bess" (89,834).

3rd No. 275 Corbett, The Hon. T. G. P., Rowallan, Kilmarnock, "Auchenbraun Yellow Kate 12" (54,219).

V No. 277 Ferguson, William L., Cairnweil, Sandhead, Stranraer, "Cairnweil Nessie Fair" (14,627).

H No. 272 Clark, John, Dunrod Farm, Inverkip, "Dunrod Tulip 2nd" (9425).

CLASS 41. HEIFER, born on or after 1st June 1926, in Calf, and due to calve before 1st December of the year of the Show.—PREMIUMS, £10, £7, and £3.

1st No. 274 Stewart, Sir Hugh Shaw, Bart., C.B., of Ardgowan, Inverkip, "Ardgowan Surprise" (15,745).

2nd No. 284 Houldsworth, Colonel W. T. R., Threave, Kirkmichael, Ayrshire, "Dunlop Majesty" (10,803).

3rd No. 285 Keir & Cawder, Limited, Keir Home Farm, Dunblane, "Keir Daffodil."

V No. 283 Houldsworth, Colonel W. T. R., Threave, Kirkmichael, Ayrshire, "Threave Wild Rose" (14,478).

H No. 281 Clark, John, Dunrod Farm, Inverkip, "Dunrod Pearl Girl" (10,818).

C No. 282 Cowhill Estate Company, Limited, Holywood, Dumfries, "Lotus Glamour" (11,952).

CLASS 42. HEIFER, born in 1927.—PREMIUMS, £10, £5, and £3.

- 1st No. 289 Cochrane, Alexander, Nether Craig, Kilmarnock, "Nether Craig Water Lily" (11,432).
 2nd No. 287 Barr, Thomas, Hobsland, Monkton, "Hobsland Lily 6th" (10,751).
 3rd No. 288 Barr, Thomas, Hobsland, Monkton, "Hobsland Snow-flight" (10,764).
 V No. 293 Orr, James, Kepculloch, Balfron Station, "Kepculloch Jenny" (16,625).
 H No. 294 Stewart, Sir Hugh Shaw, Bart., C.B., of Ardgowan, Inverkip, "Dunlop Brill" (10,796).
 C No. 291 Corbett, The Hon. T. G. P., Rowallan, Kilmarnock, "Rowallan Bess 5th" (12,691).
 C No. 290 Corbett, The Hon. T. G. P., Rowallan, Kilmarnock, "Rowallan Mint 4th" (12,695).

CLASS 43. HEIFER, born in 1928.—PREMIUMS, £8, £5, and £3.

- 1st No. 298 Cochrane, Lieut.-Colonel Lord, of Cults, Crawford Priory, Springfield, Fife, "Culds Brocade."
 2nd No. 296 Barr, Thomas, Hobsland, Monkton, "Hobsland Missie 6th" (16,590).
 3rd No. 297 Cochrane, Lieut.-Colonel Lord, of Cults, Crawford Priory, Springfield, Fife, "Culds Minx."
 V No. 301 Rottenburg, F. A., Lochlane, Crieff, "Hunthall Merit."
 H No. 300 Cowhill Estate Company, Limited, Holywood, Dumfries, "Cowhill Belinda."
 C No. 295 Barr, Thomas, Hobsland, Monkton, "Hobsland Jenny 28th" (16,578).

Special Prize of £10 for the best Male Animal of the Ayrshire breed entered with a number in the Ayrshire Cattle Herd-Book not later than 1st June 1929—given by the Ayrshire Cattle Herd-Book Society.

- No. 306 Montrose, The Duke of, C.B., C.V.O., Buchanan Castle, Drymen, "Hobsland Gallant Boy" (26,169).

Breeder of best Bull of any age in Classes 44, 45, and 46—The Silver Medal.

- No. 306 Barr, Thomas, Hobsland, Monkton.

CLASS 44. BULL, born before 1927.—PREMIUMS, £12, £8, and £4.

- 1st No. 306 Montrose, The Duke of, C.B., C.V.O., Buchanan Castle, Drymen, "Hobsland Gallant Boy" (26,169).
 2nd No. 304 Howie, James, Hillhouse, Kilmarnock, "Syke Stamp" (26,492).
 3rd No. 305 Mitchell, W. Ashby, Balbeuchly Home Farm, Dundee, "Mains Ringmaster" (26,279).

EXTRA STOCK.

The following was awarded the Silver Medal:—

- No. 307 Barr, Thomas, Hobsland, Monkton, "Hobsland Finalist" (25,219).

CLASS 45. BULL, born in 1927.—PREMIUMS, £10, £7, and £3.

- 1st No. 311 Rottenburg, F. A., Lochlane, Crieff, "Netherhall Up-to-date" (27,366).
 2nd No. 308 Blythswood, Major The Lord, K.C.V.O., Blythswood Farm, Renfrew, "Netherhall Bonny Blink" (27,358).
 3rd No. 309 Cowhill Estate Company, Limited, Holywood, Dumfries, "Auchenbrain Royal Captain" (27,542).
 V No. 310 Orr, James, Kepculloch, Balfron Station, "Kepculloch Call Boy" (28,015).

CLASS 46. BULL, born in 1928.—PREMIUMS, £8, £5, and £3.

- 1st No. 315 Montgomerie, Adam W., Lessnessock, Ochiltree, Ayrshire, "Lessnessock Sunny Jim" (28,457).
 2nd No. 314 Howie, James, Jun., Eglinton Mains, Irvine, "Hobsland Ben Hur" (27,979).
 3rd No. 313 Howie, James, Hillhouse, Kilmarnock, "Howie's Adjutant" (28,421).
 V No. 317 Scott, Hugh, Midtown, Douglas, Lanarkshire, "Netherhall Eclipse" (28,172).

BRITISH FRIESIAN.*PRESIDENT'S CHAMPION MEDAL for best British Friesian Animal.*

- No. 336 Glentanar, Lord, Glen Tanar, Aboyne, Aberdeenshire, "Drumry Butterfly" (115,434).

Reserve—No. 372 Pathhead and Sinclairtown Reform Co-operative Society, Limited, 102 Commercial Street, Kirkcaldy, "Branchal Ver Klaske" (32,343).

The MacRobert Champion Silver Bell, value 50 Guineas, for the best animal in the British Friesian Classes, registered in or eligible for entry in the British Friesian Cattle Herd-Book, "Extra Stock" being eligible to compete. Presented by Lady Rachel Workman MacRobert, Doune-side, Tarland.

- No. 336 Glentanar, Lord, Glen Tanar, Aboyne, Aberdeenshire, "Drumry Butterfly" (115,434).

Special Prizes of £7, £5, and £2 for Cows from Grade "A" (*Tuberculin Tested*) or Certified Herds, drawn from Classes 47, 48, and 49. Given by Messrs Brown & Polson, Limited, Paisley, the Hon. T. G. P. Corbett, Mr Alexander Munro, and Mr W. P. Gilmour.

(No Entry).

Champion Prize of £5, given by the British Friesian Cattle Society for the best Female exhibited.

- No. 336 Glentanar, Lord, Glen Tanar, Aboyne, Aberdeenshire, "Drumry Butterfly" (115,434).

CLASS 47. COW, in Milk, born in or before 1925.—PREMIUMS, £12, £8, £4, and £2.

- 1st No. 320 MacRobert, Trustees of Sir Alasdair W., Bart., Douneside Home Farm, Tarland, "Douneside Becula" (70,586).
 2nd No. 319 M'Ilchere, Malcolm, Cartside Farm, Thorntonhall, "Braes Faith" (90,306).
 3rd No. 318 Easson, George, Sheephousell Farm, Dunfermline, "Sheephousell Sybil" (66,104).

CLASS 48. COW in Calf, and not in Milk, born in or before 1925. PREMIUMS, £10, £5, £3, and £2.

- 1st No. 325 MacLennan, Duncan Alexander, Balmachree, Inverness, "Balmachree Amelia" (50,400).
 2nd No. 324 Logan, James, Powis Mains, Stirling, "Hattrick Noralin" (72,114).
 3rd No. 321 Bute, The Marquis of, K.T., Mount Stuart, Rothesay, "Bute Vanessa" (59,668).
 4th No. 323 Jack, A., Brunstane Mills, Musselburgh, "Tyneside Secret" (77,282).
 V No. 322 Bute, The Marquis of, K.T., Mount Stuart, Rothesay, "Bute Meibloem" (90,736).
 C No. 327 Prentice, John W., Craigrie Farm, Clackmannan, "Craigrie-lea Dairymaid" (44,248).

CLASS 49. COW in Milk, born in 1926 or 1927.—PREMIUMS, £10, £5, £3, and £2.

- 1st No. 331 Macaulay, Andrew, Lathalmond Farm, Dunfermline, "Lathalmond Lady Akke" (P.I.) (106,944).
 2nd No. 329 Glentanan, Lord, Glen Tanar, Aboyne, Aberdeenshire, "Tyneside Joukje" (P.I.) (111,114).
 3rd No. 333 Ross, Errington, Castleheather, Inverness, "Castleheather Bunt" (102,436).
 C No. 332 Pathhead and Sinclairtown Reform Co-operative Society, Limited, 102 Commercial Street, Kirkcaldy, "Abden May" (100,516).

CLASS 50. HEIFER, born in 1927.—PREMIUMS, £10, £5, £3, and £2.

- 1st No. 336 Glentanan, Lord, Glen Tanar, Aboyne, Aberdeenshire, "Drumry Butterfly" (115,434).
 2nd No. 338 Kilpatrick, James, Craigie Mains, Kilmarnock, "Craigie-mains Beauty 2nd" (114,608).
 3rd No. 340 Macaulay, Andrew, Lathalmond Farm, Dunfermline, "Whinncyhall Gem" (122,544).
 4th No. 345 Spence, Andrew, Commieston, Montrose, "Commieston Fulu" (114,418).
 V No. 341 MacRobert, Trustees of Sir Alasdair W., Bart., Douneside Home Farm, Tarland, "Douneside Maris 2nd" (115,332).
 H No. 337 Johnston, Thomas, Standalane, Falkirk, "Standalane Infanta" (121,262).
 C No. 339 Macaulay, Andrew, Lathalmond Farm, Dunfermline, "Lathalmond Maureenmijn" (118,220).

CLASS 51. HEIFER, born in 1928, before 1st July.—PREMIUMS, £10, £5, £3, and £2.

- 1st No. 351 Glentanar, Lord, Glen Tanar, Aboyne, Aberdeenshire, "Glentanar Marionette."
 2nd No. 349 Francis, G. A., West Seaton, Arbroath, "Seaton Aster 6th."
 3rd No. 350 Glentanar, Lord, Glen Tanar, Aboyne, Aberdeenshire, "Glentanar Wanda."
 4th No. 354 MacRobert, Trustees of Sir Alasdair W., Bart., Douneside Home Farm, Tarland, "Douneside Eva 2nd."
 V No. 353 MacRobert, Trustees of Sir Alasdair W., Bart., Douneside Home Farm, Tarland, "Douneside Bliss."
 H No. 352 Macaulay, Andrew, Lathalmond Farm, Dunfermline, "Lathalmond Tessmijn Again."
 C No. 348 Christison, John, Crossveggate, Milngavie, "Herrington Ideal 2nd"
 C No. 355 Pathhead and Sinclairtown Reform Co-operative Society, Limited, 102 Commercial Street, Kirkcaldy, "Abden Bloom."

CLASS 52. HEIFER, born in 1928, on or after 1st July.—PREMIUMS, £10, £5, £3, and £2.

- 1st No. 359 Christison, John, Crossveggate, Milngavie, "Crossveggate Akke 2nd."
 2nd No. 362 MacRobert, Trustees of Sir Alasdair W., Bart., Douneside Home Farm, Tarland, "Douneside Mudge 3rd."
 3rd No. 360 Francis, G. A., West Seaton, Arbroath, "Seaton Ideal Pearl 3rd."
 C No. 363 MacRobert, Trustees of Sir Alasdair W., Bart., Douneside Home Farm, Tarland, "Douneside Mollymine 4th."

Champion Prize of £5, given by the British Friesian Cattle Society for *the best Male exhibited.*

- No. 372 Pathhead and Sinclairtown Reform Co-operative Society, Limited, 102 Commercial Street, Kirkcaldy, "Branchal Ver Klaske" (32,343).

Breeder of best Bull of any age in Classes 53, 54, and 55—The Silver Medal.

- No. 372 John Telfer, Branchal, Kilmacolm.

CLASS 53. BULL, born in or before 1926.—PREMIUMS, £12, £8, £4, and £2.

- 1st No. 368 Prentice, John W., Craigrie Farm, Clackmannan, "Commieston Dorcas" (28,160).
 2nd No. 364 Christison, John, Crossveggate, Milngavie, "Douneside Pel Klaas" (P.I.) (30,901).
 3rd No. 367 Pathhead and Sinclairtown Reform Co-operative Society, Limited, 102 Commercial Street, Kirkcaldy, "Douneside Albert 2nd" (30,881).
 4th No. 366 Easson, George, Sheephouswell Farm, Dunfermline, "Castlestuart David" (30,649).
 H No. 365 Easson, George, Sheephouswell Farm, Dunfermline, "Balbairdie Harry" (24,759).

CLASS 54. BULL, born in 1927.—PREMIUMS, £10, £5, £3, and £2.

- 1st No. 372 Pathhead and Sinclairtown Reform Co-operative Society, Limited, 102 Commercial Street, Kirkcaldy, "Branchal Ver Klaske" (32,343).
 2nd No. 369 Glentamar, Lord, Glen Tanar, Aboyne, Aberdeenshire, "Glentamar Barlander" (P.I.) (32,765)
 3rd No. 370 Johnston, Thomas, Standalane, Falkirk, "Holyporth Albert" (P.I.) (32,931).
 4th No. 371 MacRobert, Trustees of Sir Alasdair W., Bart., Douneside Home Farm, Tarland, "Douneside Hatsumerschaap 2nd" (P.I.) (32,629).

CLASS 55. BULL, born in 1928.—PREMIUMS, £10, £5, £3, and £2.

- 1st No. 374 Glentamar, Lord, Glen Tanar, Aboyne, Aberdeenshire "Glentamar Lothair."
 2nd No. 373 Bute, The Marquis of, K.T., Mount Stuart, Rothesay, "Golf Meibloem's Holl Pell."

RED POLL.**PRESIDENT'S CHAMPION MEDAL for best Red Poll Animal.**

- No. 395 Robertson, William B., Colton, Dunfermline, "Colton Erry" (14,468).

Reserve—No. 385 Montrose, The Duchess of, Home Farm, Brodick, Arran, "Isle of Arran Julep" (39,630).

Kinmount Challenge Cup, value about £50, for the best Female Animal in the Red Poll Classes registered in the Red Poll Cattle Society's Herd-Book, "Extra Stock" being eligible to compete. This Cup was presented to the Society by Lieut.-Colonel Charles Brook of Kinmount, Annan.

- No. 385 Montrose, The Duchess of, Home Farm, Brodick, Arran, "Isle of Arran Julep" (39,630).

Special Prizes of £5 and £2 for Cows from Grade "A" (*Tuberculin Tested*) or *Certified Herds*, drawn from Class 56. Given by Messrs Brown & Polson, Limited, Paisley, the Hon. T. G. P. Corbett, Mr Alexander Muir, and Mr W. P. Gilmour.

(No Entry).

CLASS 56. COW in Milk or in Calf, born before 1927.—PREMIUMS, £10, £5, and £3.

- 1st No. 377 Barclay-Harvey, Charles Malcolm, Dinnet, Aberdeenshire, "Kinmount Fashion 1st" (30,081).
 2nd No. 378 Barclay-Harvey, Charles Malcolm, Dinnet, Aberdeenshire, "Kinmount Joanna" (37,780).
 3rd No. 389 Muirhead, Charles, Glentulchan, Glenalmond, "Tulchan Daisy" (36,700).
 V No. 381 Ritchie, Alexander, Cardross Home Farm, Port of Menteith Station, "Framlingham Pearly" (31,046).

CLASS 57. HEIFER, born in 1927.—PREMIUMS, £10, £5, and £3.

- 1st No. 385 Montrose, The Duchess of, Home Farm, Brodick, Arran,
"Isle of Arran Julep" (39,630).
2nd No. 386 Muirhead, Charles, Glentulchan, Glenalmond, "Tulchan
Meg" (40,518).
3rd No. 387 Ritchie, Alexander, Cardross Home Farm, Port of Menteith
Station, "Cardross Ruby" (39,084).

CLASS 58. HEIFER, born in 1928.—PREMIUMS, £10, £5, and £3.

- 1st No. 390 Montrose, The Duchess of, Home Farm, Brodick, Arran,
"Isle of Arran Jaborandi."
2nd No. 391 Robertson, William B., Colton, Dunfermline, "Colton
Frances."

CLASS 59. BULL, born in or before 1927.—PREMIUMS, £10, £5, and £3.

- 1st No. 395 Robertson, William B., Colton, Dunfermline, "Colton
Erry" (14,468).
2nd No. 392 Barclay-Harvey, Charles Malcolm, Dinnet, Aberdeenshire,
"Glenkindie Hector."
3rd No. 394 Ritchie, Alexander, Cardross Home Farm, Port of Menteith
Station, "Cardross Diamond."
V No. 393 Muirhead, Charles, Glentulchan, Glenalmond, "Crimson
Boy."

CLASS 60. BULL, born in 1928.—PREMIUMS, £10, £5, and £3.

- 1st No. 399 Montrose, The Duchess of, Home Farm, Brodick, Arran,
"Isle of Arran Juggernaut."
2nd No. 396 Barclay-Harvey, Charles Malcolm, Dinnet, Aberdeenshire, •
"Kinord Jessman."

HORSES.

CLYDESDALE STALLION AND COLT.

*PRESIDENT'S CHAMPION MEDAL for best Clydesdale
Stallion or Colt.*

No. 403 Kilpatrick, James, Craigie Mains, Kilmarnock, "Craigie Winalot" (21,322).

Reserve—No. 421 Clark, Thomas, Pitlandie, Stanley, Perth, "Royal Factor" (21,675).

Paisley Perpetual Gold Challenge Cup, value £300, *for best Clydesdale Stallion or Colt, "Extra Stock" being eligible to compete.* This Cup, along with an endowment of £600, was provided from money collected in Paisley by the late Provost Muir MacKean, and is in commemoration of the Society's first Show at Paisley in 1913.

No. 403 Kilpatrick, James, Craigie Mains, Kilmarnock, "Craigie Winalot" (21,322).

Reserve—No. 421 Clark, Thomas, Pitlandie, Stanley, Perth, "Royal Factor" (21,675).

Cawdor Challenge Cup, value 50 Guineas, *for best Clydesdale Stallion or Colt registered in the Clydesdale Stud-Book*—given by the Clydesdale Horse Society.

No. 403 Kilpatrick, James, Craigie Mains, Kilmarnock, "Craigie Winalot" (21,322).

Breeder of best Male Animal of any age in Classes 61, 62, 63, and 64—
The Silver Medal.

No. 403 Joseph Harper, Rathillet, Cupar, Fife.

CLASS 61. STALLION, born before 1926.—PREMIUMS,
£20, £15, £10, and £4.

1st No. 403 Kilpatrick, James, Craigie Mains, Kilmarnock, "Craigie Winalot" (21,322).

2nd No. 401 Adams, David, Auchencraig, Dumbarton, "Satisfaction" (21,293).

3rd No. 407 Somerville, T. Purdie, Sandilands, Lanark, "Scotland's Marcellus" (21,383).

4th No. 400 Adams, David, Auchencraig, Dumbarton, "Robertprint" (21,122).

V No. 405 Montgomery, A., & Company, Jordieland, Kirkcudbright, "Lascelles" (20,773).

H No. 404 M'Connell, James, Boreland, Whauphill, "Brightness" (21,183).

C No. 408 Wyllie, Scott, Milton of Luncarty, Perth, "Milton Index" (21,357).

**CLASS 62. ENTIRE COLT, born in 1926.—PREMIUMS,
£20, £15, £10, and £4.**

- 1st No. 415 Templeton, T. & M., Sandyknowe, Kelso, "Beneficent"
(21,572).
2nd No. 411 Clark, Thomas, Pitlandie, Stanley, Perth, "Full Tide"
(21,488).
3rd No. 410 Cairns, James, Abercromby, St. Monance, "Spectroscope"
(21,537).
4th No. 416 Wyllie, Scott, Milton of Luncarty, Perth, "Milton Moncur"
(21,513).
V No. 414 Sharp, T. Mercer, Bardrill, Blackford, "Bardrill Choice"
(21,431).

William Taylor Memorial Prize of £10 and Certificate to the Breeder of the
best Clydesdale Colt entered in Classes 63 and 64—given by William
Taylor Memorial Committee.

No. 421 Pat Barclay, Manorleys, Kinglassie.

**CLASS 63. ENTIRE COLT, born in 1927.—PREMIUMS,
£20, £15, £10, and £4.**

- 1st No. 421 Clark, Thomas, Pitlandie, Stanley, Perth, "Royal Factor"
(21,675).
2nd No. 434 Templeton, T. & M., Sandyknowe, Kelso, "Caledonia"
(21,595).
3rd No. 432 Sleigh, John P., of St. John's Wells, Fyvie, "Wells Lorne"
(21,692).
4th No. 435 Templeton, T. & M., Sandyknowe, Kelso, "Earl Haig"
(21,627).
V No. 425 Johnston, John, & Son, Dunmore Home Farm, Falkirk,
"Dunmore Reflector."
H No. 436 Templeton, T. & M., Sandyknowe, Kelso, "Benedictus"
(21,571).
C No. 423 Jackson, Robert, Reedyloch, Edrom, Berwickshire,
"Dowhill Author" (21,621).
C No. 427 Kilpatrick, James, Craigie Mains, Kilmarnock, "Craigie
M'Gregor" (21,611).
C No. 429 Park, Robert, Brunstane, Portobello, "Brunstane Dene."

**CLASS 64. ENTIRE COLT, born in 1928.—PREMIUMS,
£15, £10, £6, and £4.**

- 1st No. 443 Johnston, John, & Son, Dunmore Home Farm, Falkirk,
"Dunmore Supreme."
2nd No. 454 Templeton, T. & M., Sandyknowe, Kelso, "Beneficence."
3rd No. 455 Templeton, T. & M., Sandyknowe, Kelso, "Braemar."
4th No. 447 Kilpatrick, James, Craigie Mains, Kilmarnock, "Craigie
Count."
V No. 456 Wyllie, Scott, Milton of Luncarty, Perth, "Milton Ideal."
H No. 437 Brown, Andrew, Greenlaw, Newton Mearns, "Perfect
Print."
C No. 444 Johnston, John, & Son, Dunmore Home Farm, Falkirk,
"Dunmore Select."
C No. 451 Somerville, T. Purdie, Sandilands, Lanark.

CLYDESDALE GELDING

got by Registered Clydesdale Stallion.

PRESIDENT'S CHAMPION MEDAL for best Clydesdale Gelding.

No. 460 Clark, Alexander, Strathore, Thornton, "Dan."

Reserve—No. 471 Kerr, William, Bell Mount, Penrith, "Lofty King."**CLASS 65. GELDING, born before 1926.—PREMIUMS,**
£12, £8, £4, and £2.

- 1st No. 460 Clark, Alexander, Strathore, Thornton, "Dan."
- 2nd No. 459 Chapman, R. & J., Johnston, Gartcosh, "Stirling Castle."
- 3rd No. 458 Bowser, D. C., Mains of Argaty, Doune, "Barney."
- 4th No. 462 Goldie, David, Barassie Farm, Troon, "Harry."
- V No. 457 Adamson, James R., Bruckley, Dairsie, "Billy."
- H No. 463 Gray, James, West Newhall, Kingsbarns, "Sport."
- C No. 465 Miller, William S., Jun., Balmanno Castle, Bridge of Earn, "Baldy."
- C No. 467 Rottenburg, F. A., Lochlane, Crieff, "Lochlane Sam."

CLASS 66. GELDING, born in 1926.—PREMIUMS,
£12, £8, £4, and £2.

- 1st No. 471 Kerr, William, Bell Mount, Penrith, "Lofty King."
- 2nd No. 469 Farquhar, Andrew, Middleton, Bowling, "Director."
- 3rd No. 472 M'Connell, A. W., Scraesburgh, Jedburgh, "Profit."
- 4th No. 474 Rottenburg, F. A., Lochlane, Crieff, "Lochlane Sensation."
- V No. 470 Farquhar, Andrew, Middleton, Bowling, "M'Duff."
- H No. 475 Young, John, Cobblebrae, Falkirk, "Jim."
- C No. 468 Brechin, Robert, Lochmill, Linlithgow, "Willie."
- C No. 473 Miller, William S., Jun., Balmanno Castle, Bridge of Earn, "Billy."

CLASS 67. GELDING, born in 1927.—PREMIUMS,
£12, £8, £4, and £2.

- 1st No. 478 Johnston, John, & Son, Dunmore Home Farm, Falkirk, "King William."
- 2nd No. 479 M'Connell, A. W., Scraesburgh, Jedburgh, "Deposit."
- 3rd No. 476 Adamson, James R., Bruckley, Dairsie, "Stanley."
- 4th No. 480 Wilson, William, Blackbyres, Barrhead, "Armour."
- V No. 477 Anderson, Sir Kenneth S., Bart., K.C.M.G., The Yair, Galashiels, "The Squire."

CLYDESDALE MARE AND FILLY.*PRESIDENT'S CHAMPION MEDAL for best Clydesdale Mare or Filly.*

No. 495 Park, Robert, Brunstane, Portobello, "Brunstane Phyllis."

Reserve—No. 515 Templeton, T. & M., Sandyknowe, Kelso, "Fyvie Primrose."

Cawdor Challenge Cup, value 50 Guineas, for best Clydesdale Mare or Filly registered in the Clydesdale Stud-Book—given by the Clydesdale Horse Society.

No. 515 Templeton, T. & M., Sandyknowe, Kelso, "Fyvie Primrose."

CLASS 68. MARE of any age, with foal at foot.—
PREMIUMS, £20, £12, £7, and £4.

- 1st No. 483 Dalziel, Robert, Rue, Holywood, Auldgirth, "Rue May Queen."
 2nd No. 485 Kerr, J. E., of Harviestoun, Dollar, "Harviestoun Alanna."
 3rd No. 484 Gray, James, West Newhall, Kingsbarns, "Peggy of Crawfordston" (54,554).
 4th No. 481 Beck, G. M., The Lane, Ravenstonedale, Westmorland, "Craigie Beauty" (56,012).
 V No. 486 Ross, Errington, Castleheather, Inverness, "Polly of Kerse" (54,957).
 H No. 482 Cairns, James, Abercromby, St. Monance, "Abercromby Brunette."

CLASS 69. YELD MARE, born before 1926.—
PREMIUMS, £15, £9, £6, and £4.

- 1st No. 495 Park, Robert, Brunstane, Portobello, "Brunstane Phyllis."
 2nd No. 487 Armstrong, J. A., The Beeches, Tarraby, Carlisle, "Virol" (56,931).
 3rd No. 493 M'Dowall, David, Glenhowl, Glenluce, "Flower o' the Heather" (55,415).
 4th No. 490 Graham, Thomas, Ballone, St. Andrews, "Jean."
 V No. 489 Graham, George, Faraway Farm, Kippen Station, "Faraway Themis" (56,527).
 H No. 491 Gray, James, West Newhall, Kingsbarns, "Crawfordston Margaret."
 C No. 488 Fletcher, Captain A. M. Talbot, of Saltoun, Saltoun Hall, Pencaitland, East Lothian, "Ginger Snap."

CLASS 70. YELD MARE or FILLY, born in 1926.
—PREMIUMS, £15, £9, £6, and £4.

- 1st No. 501 Murdoch, Alexander, East Hallside, Hallside, Lanarkshire, Filly, "Mary Rose."
 2nd No. 496 Adams, David, Auchencraig, Dumbarton, Mare, "Powerful Link."
 3rd No. 504 Templeton, T. & M., Sandyknowe, Kelso, Mare, "Pearl."
 4th No. 499 Kerr, J. E., of Harviestoun, Dollar, Filly, "Harviestoun Alida."
 V No. 497 Beck, G. M., The Lane, Ravenstonedale, Westmorland, Filly, "Lane Benefactress."
 H No. 498 Gray, James, West Newhall, Kingsbarns, Filly, "Crawfordston Gem."
 C No. 500 Mather, William, Milne Graden, Coldstream, Filly, "Benona."

CLASS 71. FILLY, born in 1927.—PREMIUMS, £15, £9, £6, and £4.

- 1st No. 515 Templeton, T. & M., Sandyknowe, Kelso, "Fyvie Primrose"
 2nd No. 507 Cairns, James, Abercromby, St. Monance, "Abercromby Ella."
 3rd No. 514 Rottenburg, F. A., Lochlane, Crieff, "Lochlane Felicity."
 4th No. 505 Armstrong, J. A., The Beeches, Tarraby, Carlisle, "Anita."
 V No. 510 Johnston, John, & Son, Dunmore Home Farm, Falkirk, "Carmen."
 H No. 511 Kerr, J. E., of Harviestoun, Dollar, "Harviestoun Nadine."
 C No. 516 Westwood, J. & W., Dalreoch, Dunning, "Benefit."
 C No. 509 Dick, James, Ballinton, Thornhill, Stirling, "Margot."

CLASS 72. FILLY, born in 1928.—PREMIUMS, £15, £9, £6, and £4.

- 1st No. 523 M'Dowall, David, Glenhowl, Glenluce, "Rose Marie."
 2nd No. 521 Kerr, J. E., of Harviestoun, Dollar, "Harviestoun Babette."
 3rd No. 529 Park, Robert, Brunstane, Portobello, "Brunstane Letitia."
 4th No. 531 Rottenburg, F. A., Lochlane, Crieff, "Lochlane Clarkia."
 V No. 519 Cairns, James, Abercromby, St. Monance, "Abercromby Ideal."
 H No. 517 Beck, G. M., The Lane, Ravenstonedale, Westmorland, "Lane Snowflake."
 C No. 526 Murdoch, Alexander, East Hallside, Hallside, Lanarkshire, "Onaway."
 C No. 532 Somerville, T. Purdie, Sandilands, Lanark.

SHIRE.*PRESIDENT'S CHAMPION MEDAL for best Shire Animal
in Classes 73 and 75.*

- No. 553 Loyd, A. Thomas, Lockinge House, Wantage, Berkshire, Mare, "Lockinge Ridgeway Rose" (119,877).
Reserve—No. 552 Holm, Allan, The Grange, Tilton, Leicestershire, Mare, "Tilton Abbess" (119,057).

**CLASS 73. STALLION or COLT, born before 1928.
—PREMIUMS, £20, £15, £10, and £4.**

- 1st No. 538 Devonshire, The Duke of, Chatsworth, Bakewell, Stallion, "Cippenham Friar" (38,110).
 2nd No. 539 Griffin, F. W., Boro' Fen, Peterborough, Stallion, "Boro' Renown" (40,037).
 3rd No. 537 Cumber, William J., Theale, Reading, Stallion, "Theale Jock" (40,178).
 4th No. 535 Belcher, J. Morris, Tibberton Manor, Wellington, Shropshire, Stallion, "Tibberton Premier King" (40,437).

CLASS 74. GELDING, by a registered Shire Stallion, born before 1927.—PREMIUMS, £12, £8, £4, and £2.

- 1st No. 543 Hanson, Joseph, & Sons, Railway Arches, Milnesbridge, Huddersfield, "Bradford Grey King."
 2nd No. 545 Mann, Crossman, & Paulin, Limited, Albion Brewery, Whitechapel, London, E. 1, "Lancaster."
 3rd No. 541 Cooper, Carl, 432 Barlow Moor Road, Chorlton-cum-Hardy, Manchester, "Caesar."
 4th No. 547 Sherwin, Ernest, Rand Grange, Bedale, Yorkshire, "Rand Footprint."
 V No. 542 Cooper, Carl, 432 Barlow Moor Road, Chorlton-cum-Hardy, Manchester, "Fylde Swell."
 H No. 544 Liverpool Corporation, 30 Hatton Garden, Liverpool, "Ypsilanti."

CLASS 75. YELD MARE or FILLY, born before 1928.

—PREMIUMS, £15, £9, £6, and £4.

- 1st No. 553 Loyd, A. Thomas, Lockinge House, Wantage, Berkshire, Mare, "Lockinge Ridgeway Rose" (119,877).
 2nd No. 552 Holm, Allan, The Grange, Tilton, Leicestershire, Mare, "Tilton Abbess" (119,057).
 3rd No. 548 Barker, C. & M., Stilton House, Helmsby, Yorkshire, Mare, "Edingale Rose" (118,141).
 4th No. 554 Sumner, W. & J., Fulwood, Preston, Lancashire, Mare, "Bradgate Fashion" (117,884).
 V No. 551 Foster, G. R. C., Anstey Hall, Trumpington, Cambridgeshire, Mare, "Eveline" (119,635).
 H No. 549 Cumber, William J., Theale, Reading, Mare, "Oldport Rose Marie" (121,149).

EXTRA STOCK.

The following was awarded the Silver Medal:—

- No. 555 Devonshire, The Duke of, Chatsworth, Bakewell, Mare, "Ledwyche Pearl" (120,991).

(For Exhibition Only).

The following were awarded the Silver Medal:—

SUFFOLK HORSES.*Per Suffolk Horse Society, Woodbridge, Suffolk.*

- No. 556 Rich, Mrs Evelyn, Wretham Hall, Thetford, Norfolk, Stallion, "Morston Gold King" (5643).
 No. 557 Rich, Mrs Evelyn, Wretham Hall, Thetford, Norfolk, Gelding, "Briton."
 No. 558 Quilter, Sir Cuthbert, Bart., Bawdsey Manor, Woodbridge, Suffolk, Mare, "Bawdsey Two-Step" (13,689).

HUNTERS.*PRESIDENT'S CHAMPION MEDAL for best Hunter.*

- No. 568 Buchanan-Jardine, Sir John William, of Castlemilk, Bart., Castlemilk, Lockerbie, Gelding, "Glenholme."
 Reserve—No. 588 Thomson, Moffat S., Lambden, Greenlaw, Gelding, "Sky Pilot."

CLASS 76. HUNTER BROOD MARE, with Foal at foot.

PREMIUMS, £15, £7, and £3.

- 1st No. 563 Drummond, Mrs, of Megginch, Megginch Castle, Errol, "Sunshine."
 2nd No. 559 Brook, Colonel Charles, of Kinmount, Annan, "Lady Luck."
 3rd No. 560 Carthew-Yorstoun, Miss, Parkend, Lockerbie, "Lallywit."
 V No. 562 Currie, Miss Thomson, Clatto, Cupar, Fife, "Demerara" (6692).
 II No. 564 Duguid, Miss H. M., Manar, Inverurie, "Faith."

Best Hunter Filly, not exceeding three years old, registered with a number in the Hunter Stud-Book, or the entry tendered within a month of the award—Champion Gold Medal, given by the Hunters' Improvement and National Light Horse Breeding Society.

- No. 597 Thomson, A. D., Nenthorn, Kelso, Filly, "Golden Ray."
 Reserve—No. 587 Thomson, A. D., Nenthorn, Kelso, Filly, "Deception."

CLASS 77. YELD MARE, FILLY, or GELDING, born in 1926
—in hand.—PREMIUMS, £10, £5, and £3.

- 1st No. 568 Buchanan-Jardine, Sir John William, of Castlemilk, Bart.,
 Castlemilk, Lockerbie, Gelding, "Glenholme."
 2nd No. 571 Drummond, Mrs. of Megginch, Megginch Castle, Errol,
 Gelding, "Irish Jig" (1080).
 3rd No. 572 Kennedy, John G., 28 Moray Place, Edinburgh, Gelding,
 "Storm."
 V No. 573 Paton, Alastair W., Pawston, Mindrum, Northumberland,
 Filly, "Glorette" (7139).
 H No. 569 Buchanan-Jardine, Sir John William, of Castlemilk, Bart.,
 Castlemilk, Lockerbie, Filly, "Sepia."
 C No. 566 Brook, Colonel Charles; of Kinmount, Annan, Gelding,
 "Wait and See."

CLASS 78. YELD MARE, FILLY, or GELDING, born in 1927
—in hand.—PREMIUMS, £10, £5, and £3.

- 1st No. 588 Thomson, Moffat S., Lambden, Greenlaw, Gelding, "Sky
 Pilot."
 2nd No. 587 Thomson, A. D., Nenthorn, Kelso, Filly, "Deception."
 3rd No. 576 Brook, Colonel Charles, of Kinmount, Annan, Filly,
 "Mince Pie."
 V No. 583 Maxwell, Miss Stirling, Pollok House, Glasgow, Filly,
 "Holly."
 H No. 577 Cheape, Brig.-General R., C.M.G., D.S.O., M.C., Well-
 field, Gateside, Gelding, "Ballyfata."
 C No. 584 Paton, Alastair W., Pawston, Mindrum, Northumberland,
 Filly, "Georgina."

CLASS 79. FILLY, COLT, or GELDING, born in 1928—
in hand.—PREMIUMS, £10, £5, and £3.

- 1st No. 597 Thomson, A. D., Nenthorn, Kelso, Filly, "Golden Ray."
 2nd No. 589 Buchanan-Jardine, Sir John William, of Castlemilk, Bart.,
 Castlemilk, Lockerbie, Gelding, "Brown Study"
 (1215).
 3rd No. 591 Drummond, Mrs. of Megginch, Megginch Castle, Errol,
 Gelding, "Good Egg."
 V No. 595 Spencer-Nairn, Major Sir Robert, Leslie House, Leslie,
 Colt, "Elector."
 H No. 593 Liddell-Grainger, Lady Muriel, Ayton Castle, Berwick-
 shire, Colt, "Macmerry."
 C No. 592 Dudgeon, John G., Easter Dalmeny, Dalmeny, Filly,
 "Sweet Briar."

CLASS 80. MARE or GELDING, born before 1925, to carry 13 stone
and over—in saddle.—PREMIUMS, £15, £10, and £5.

- 1st No. 605 Thomson, A. D., Nenthorn, Kelso, Gelding, "St. Anthony."
 2nd No. 598 Bute, The Marchioness of, Mount Stuart, Rothesay,
 Gelding, "Songster."
 3rd No. 600 Coats, Major J. A., Auchans, Dundonald, Mare, "Benson."
 V No. 599 Cheape, Brig.-General R., C.M.G., D.S.O., M.C., Wellfield,
 Gateside, Gelding, "Nordesk."
 H No. 604 Spencer-Nairn, Major Sir Robert, Leslie House, Leslie,
 Gelding, "Friar."
 C No. 602 Sanderson, J. Martin, Linthill, Lilliesleaf, Gelding, "Grey
 Boy."

CLASS 81. MARE or GELDING, born before 1925, to carry under 13 stone—*in saddle*.—PREMIUMS, £15, £10, and £5.

- 1st No. 609 Dunn, Andrew, Redden, Kelso, Gelding, "Billy Dear."
 2nd No. 613 Thomson, Moffat S., Lambden, Greenlaw, Mare, "Miss Murphy."
 3rd No. 612 Thomson, A. D., Nenthorn, Kelso, Gelding, "Tantoro."
 V No. 608 Coats, Major J. A., Auchans, Dundonald, Gelding, "Waverton."
 H No. 607 Cadzow, John, Glendevon, Winchburgh, Mare, "Tea for Two."

CLASS 82. MARE or GELDING, born in 1925—*in saddle*.—PREMIUMS, £15, £10, and £5.

- 1st No. 615 Colville, David, Chapel-on-Leader, Earliston, Gelding, "Neptune."
 2nd No. 620 Thomson, A. D., Nenthorn, Kelso, Gelding, "Simple Simon."
 3rd No. 614 Cheape, Brig.-General R., C.M.G., D.S.O., M.C., Wellfield, Gateside, Gelding, "The Howling Mob."
 V No. 621 Thomson, Moffat S., Lambden, Greenlaw, Mare, "Dusk."
 H No. 616 Cunningham, Alan U., Hedderwick Hill, Dunbar, Mare, "Lady Norah" (6754).
 C No. 617 Dudgeon, A. Neill, Humble, Kirkliston, Mare, "Ardmona."

HIGHLAND PONY.

PRESIDENT'S CHAMPION MEDAL for best Highland Pony.

- No. 624 Wright, J. Moncrieff, of Kinmonth, Bridge of Earn, "Glenbernesdale" (891).

Reserve—No. 626 Fletcher, Mrs., of Rosehaugh, Avoch, Ross-shire, "Lady Mora" (3378).

Special Prize of £10 for the best Highland Stallion, Mare, Colt, or Filly, entered or accepted for entry in the Highland Section of the National Pony Stud-Book, "Extra Stock" being eligible to compete—given by the National Pony Society and the Highland Pony Society.

- No. 624 Wright, J. Moncrieff, of Kinmonth, Bridge of Earn, "Glenbernesdale" (891).

CLASS 83. STALLION, born before 1927, not exceeding 14.2 Hands.—PREMIUMS, £8, £4, and £2.

- 1st No. 623 Honeyman, R. Wemyss, Derculich, Strathtay, "Thor 2nd" (1054).

EXTRA STOCK.

The following were awarded the Silver Medal:—

- No. 622 Glentanar, Lord, Glen Tanar, Aboyne, "Banchor Buidhe of Farr" (1191).
 No. 624 Wright, J. Moncrieff, of Kinmonth, Bridge of Earn, "Glenbernesdale" (891).

CLASS 84. MARE, born before 1927, not exceeding 14.2 Hands,
Yeld or with Foal at foot.—PREMIUMS, £8, £4, and £2.

- 1st No. 626 Fletcher, Mrs, of Rosehaugh, Avoch, Ross-shire, "Lady Mora" (3378).
 2nd No. 628 Mackelvie, Donald, New Lanark, Lamlash, "Doon" (5943).
 3rd No. 630 Nasmyth, Norman I., of Glenfarg, Abernethy, "Violet of Glenfarg" (5254).
 V No. 629 Maxwell, Miss Stirling, Pollok House, Glasgow, "Corrour Cailleach."
 H No. 625 Fletcher, Mrs, of Rosehaugh, Avoch, Ross-shire, "Bluebell V" (3377).
 C No. 631 Wright, J. Moncrieff, of Kinmonth, Bridge of Earn, "Hylda of Kinmonth" (5510).

CLASS 85. ENTIRE COLT, born on or after 1st January 1927.
—PREMIUMS, £6, £4, and £2.

- 1st No. 632 Glentamar, Lord, Glen Tanar, Aboyne, "Glen Tanar Fingal."

CLASS 86. FILLY, born on or after 1st January, 1927.
—PREMIUMS, £6, £4, and £2.

- 1st No. 633 Cairns, James M., Ardlarach House, Isle of Luing, Oban, "Moldagh."
 2nd No. 635 Wright, J. Moncrieff, of Kinmonth, Bridge of Earn, "Dorothy of Kinmonth."
 3rd No. 634 Glentamar, Lord, Glen Tanar, Aboyne, "Glen Tanar Dersagrena."

WESTERN ISLAND PONY.

PRESIDENT'S CHAMPION MEDAL for best Western Island Pony.

- No. 638 Cross, Sir William, Bart., of Scatwell, Muir of Ord, "Bonnie Charlie of Farr" (1124).

Reserve—No. 653 Wright, J. Moncrieff, of Kinmonth, Bridge of Earn, "Isle of Arran Bonnie Jean" (4408).

Special Prize of £10 for the best Western Island Stallion, Mare, Colt, or Filly, entered or accepted for entry in the Highland Section of the National Pony Stud-Book, "Extra Stock" being eligible to compete—given by the National Pony Society and the Highland Pony Society.

- No. 638 Cross, Sir William, Bart., of Scatwell, Muir of Ord, "Bonnie Charlie of Farr" (1124).

CLASS 87. STALLION, born before 1927, not exceeding 14 Hands.
—PREMIUMS, £8, £4, and £2.

- 1st No. 636 Mackelvie, Donald, New Lanark, Lamlash, "Ben Varen" (1422).
 2nd No. 637 Mackenzie, Major H. M., Moorside Farm, Caton, Lancaster, "Odin" (1489).

EXTRA STOCK.

The following was awarded the Silver Medal :

- No. 638 Cross, Sir William, Bart., of Scatwell, Muir of Ord, " Bonnie Charlie of Farr " (1124).

CLASS 88. MARE, born before 1927, not exceeding 14 Hands.
Yeld or with Foal at foot.—PREMIUMS, £8, £4, and £2.

- 1st No. 644 Duguid, Miss H. M., Manar, Inverurie, " Maida of Manar " (5255).
2nd No. 641 Cairns, James M., Ardlarach House, Isle of Luing, Oban, " Calliach Bhan VIII." (5517).
3rd No. 649 Sharp, Miss E. C., Balmuir, Dundee, " Sheila of Dalnaglar " (4745).
V No. 647 Mackelvie, Donald, New Lanark, Lamlash, " Monyquill " (5517).
H No. 648 Montrose, The Duke of, Brodick Castle, Arran, " Isle of Arran Elspeth " (4711).
C No. 640 Cairns, James M., Ardlarach House, Isle of Luing, Oban, " Calliach Bhan VII."

EXTRA STOCK.

The following was awarded the Silver Medal :

- No. 653 Wright, J. Moncrieff, of Kinmonth, Bridge of Earn, " Isle of Arran Bonnie Jean " (4408).

CLASS 89. ENTIRE COLT, born on or after 1st January 1927.
—PREMIUMS, £6, £4, and £2.

- 1st No. 655 Mackenzie, Major H. M., Moorside Farm, Caton, Lancaster, " Heather Lad " (1634).
2nd No. 654 Mackelvie, Donald, New Lanark, Lamlash, " Sian " (1639).
3rd No. 656 Sharp, Miss E. C., Balmuir, Dundee, " Hector of Dalnaglar."
V No. 657 Webster, Miss E. Ruth, Ashbrook, Arbroath, " Glenminian."

CLASS 90. FILLY, born on or after 1st January, 1927.
—PREMIUMS, £6, £4, and £2.

- 1st No. 658 Mackenzie, Major H. M., Moorside Farm, Caton, Lancaster, " Little Polly III." (5914).
2nd No. 659 Wright, J. Moncrieff, of Kinmonth, Bridge of Earn, " Ella of Kinmonth."

SHETLAND PONY.

(ALL SHOWN IN HAND).

PRESIDENT'S CHAMPION MEDAL for best Shetland Pony.

- No. 661 Duffus, Mrs Etta, Penniwells, Elstree, Herts., " Duncan of Overacres " (1216).
Reserve—No. 681 Duffus, Mrs Etta, Penniwells, Elstree, Herts., " Brend of Earlsall " (3391).

Silver Cup for best Shetland Pony of any age, drawn from ordinary Classes—and shown in saddle (to be judged by the Hunter Judge)—given by a past President of the Shetland Pony Stud-Book Society.

No. 665 Straker, Miss Phyllis, Stagshaw, Corbridge-on-Tyne, "Nomad of Balmuir."

Best Group of Shetland Ponies, drawn from the ordinary Classes, consisting of one male and two females; one female to be a mare with foal at foot, but the foal not to be reckoned as one of the Group. PREMIUM, £10—given by "Four Lovers of the Breed," per Mr W. Mungall of Transy.

Nos. 661, 671 and 681 Duffus, Mrs Etta, Penniwells, Elstree, Herts.

Silver Medal for the best Shetland Pony of the sex opposite to that of the winner of the President's Medal, entered or eligible for entry in the Shetland Pony Stud-Book—given by the Shetland Pony Stud-Book Society.

No. 681 Duffus, Mrs Etta, Penniwells, Elstree, Herts., "Brend of Earlsall" (3391).

CLASS 91. STALLION, not exceeding 10½ Hands, born before 1926.—PREMIUMS, £8, £5, £3, and £2.

1st No. 661 Duffus, Mrs Etta, Penniwells, Elstree, Herts., "Duncan of Overacres" (1216).

2nd No. 662 Mackenzie, R. W. R., Carpow, Newburgh, Fife, "Brass Hat."

3rd No. 664 Mungall, William, of Transy, Dunfermline, "Sonyad of Transy" (1105).

4th No. 660 Coats, Miss Evelyn M., Corsebar, Paisley, "Haugh of Urr" (997).

V No. 665 Straker, Miss Phyllis, Stagshaw, Corbridge-on-Tyne, "Nomad of Balmuir."

H No. 663 Mackenzie, R. W. R., Carpow, Newburgh, Fife, "Darnel of Earlsall" (1190).

CLASS 92. ENTIRE COLT, not exceeding 10½ Hands, born in 1926 or 1927.—PREMIUMS, £8, £5, £3, and £2.

1st No. 666 Duffus, Mrs Etta, Penniwells, Elstree, Herts., "Khitmagur of Penniwells."

2nd No. 668 Mackenzie, R. W. R., Carpow, Newburgh, Fife, "Dollar Boy."

3rd No. 669 Mungall, William, of Transy, Dunfermline, "Rosador of Transy."

4th No. 667 Kerr, J. E., of Harviestoun, Dollar, "Harviestoun Max."

CLASS 93. MARE, not exceeding 10½ Hands, with Foal at foot.—PREMIUMS, £8, £5, £3, and £2.

1st No. 677 Mungall, William, of Transy, Dunfermline, "Maid of Kirkland."

2nd No. 676 Mungall, William, of Transy, Dunfermline, "Saidee of Transy."

3rd No. 675 Mackenzie, R. W. R., Carpow, Newburgh, Fife, "Virtuous of Earlsall" (4076).

4th No. 671 Duffus, Mrs Etta, Penniwells, Elstree, Herts., "Jean."

V No. 678 Straker, Miss Phyllis, Stagshaw, Corbridge-on-Tyne, "Dianthus of Earlsall" (4359).

H No. 673 Kerr, J. E., of Harviestoun, Dollar, "Harviestoun Sheila."

C No. 670 Butter, Misses J. and M., Cluniemore, Pitlochry, "Bonnie of Earlsall."

CLASS 94. YELD MARE, not exceeding 10½ Hands.

—PREMIUMS, £8, £5, £3, and £2.

- 1st No. 681 Duffus, Mrs Etta, Penniwells, Elstree, Herts., "Brend of Earlshall" (3391).
 2nd No. 683 Mackenzie, R. W. R., Carpow, Newburgh, Fife, "Ruby of Earlshall" (3733).
 3rd No. 684 Mungall, William, of Transy, Dunfermline, "Felecia of Transy" (3945).
 4th No. 682 Kerr, J. E., of Harviestoun, Dollar, "Harviestoun Stella" (4341).
 V No. 680 Coats, Miss Evelyn M., Corsebar, Paisley, "Vassa Beauty" (3899).
 H No. 679 Butter, Misses J. and M., Cluniemore, Pitlochry, "Madge of Earlshall."

CLASS 95. FILLY, not exceeding 10½ Hands, born in 1926 or 1927.

—PREMIUMS, £8, £5, £3, and £2.

- 1st No. 686 Duffus, Mrs Etta, Penniwells, Elstree, Herts., "The Belle of Penniwells."
 2nd No. 687 Kerr, J. E., of Harviestoun, Dollar, "Harviestoun Pryde."
 3rd No. 689 Mungall, William, of Transy, Dunfermline, "Helsa of Transy."
 4th No. 688 Kerr, J. E., of Harviestoun, Dollar, "Harviestoun Sheba."
 V No. 685 Coats, Miss Evelyn M., Corsebar, Paisley, "Delegate."

RIDING PONY.**CLASS 96. MARE or GELDING**, any age, over 12 Hands and not exceeding 14 Hands, in saddle, to be ridden by boy or girl 10 years and under 14 years of age on first day of Show.—PREMIUMS, £5, £3, and £2.

- 1st No. 693 Liddell-Grainger, Lady Muriel, Ayton Castle, Berwickshire, Gelding, "Cherry Pie."
 2nd No. 690 Bell-Irving, Miss Mary, White Hill, Lockerbie, Mare, "Hunca Munca."
 3rd No. 692 Forrester, Miss E., Tullibody House, Cambus, Gelding, "Tullibody Pryde."

CLASS 97. MARE or GELDING, any age, not exceeding 12 Hands, in saddle, to be ridden by boy or girl under 10 years of age on first day of Show.—PREMIUMS, £5, £3, and £2.

- 1st No. 698 Liddell-Grainger, Lady Muriel, Ayton Castle, Berwickshire, Mare, "Cinderella."
 2nd No. 699 Taylor, Master Robert, Hendersyde Park, Kelso, Gelding, "Cloud."
 3rd No. 700 Thomson, Miss Enid, Nenthorn, Kelso, Mare, "Ginette."
 V No. 701 Wilson, Mrs G. L., Wellsbourne, Ayr, Mare "Dinah."
 H No. 697 Duguid, Miss H. M., Manar, Inverurie, Gelding, "Quick-silver."

HORSE IN HARNESS.

PRESIDENT'S CHAMPION MEDAL for best animal in the Classes for Horses in Harness.

No. 711 Miller, William S., Balmanno Castle, Bridge of Earn, Mare, "Eastertide" (26,108).

Reserve—No. 704 Miller, William S., Balmanno Castle, Bridge of Earn, Gelding, "Knight of the Thistle" (G 567).

The "Glasgow" Champion Challenge Cup, value £50, for best Horse in Single Harness; competition limited to First, Second, and Third Prize-Winners in Harness Classes, and animals entered as "Extra Stock."

No. 711 Miller, William S., Balmanno Castle, Bridge of Earn, Mare, "Eastertide" (26,108).

CLASS 98. YELD MARE, FILLY, or GELDING, any age, in Harness, exceeding 15 Hands, to be driven in the ring.—PREMIUMS, £15, £10, and £5.

1st No. 704 Miller, William S., Balmanno Castle, Bridge of Earn, Gelding, "Knight of the Thistle" (G 567).

2nd No. 703 M'Donald, George, Roedene, Larch Road, Dumbreck, Glasgow, Gelding, "Spellbinder" (G 590).

3rd No. 702 Glen, Enoch, Kaim Park, Bathgate, Gelding, "Glenavon Reveille" (G 655).

CLASS 99. YELD MARE, FILLY, or GELDING, any age, in Harness, over 14 Hands and not exceeding 15 Hands, to be driven in the ring.—PREMIUMS, £15, £10, and £5.

1st No. 705 Glen, Enoch, Kaim Park, Bathgate, Mare, "Glenavon Sunrise" (26,687).

2nd No. 707 M'Donald, George, Roedene, Larch Road, Dumbreck, Glasgow, Mare, "Dumbreck Gold Flake" (26,782).

3rd No. 706 Kinross, William, 13 Clarendon Place, Stirling, Mare, "Broompark Stella" (26,708).

CLASS 100. YELD MARE, FILLY, or GELDING, any age, not exceeding 14 Hands, to be driven in the ring.—PREMIUMS, £10, £5, and £3.

1st No. 711 Miller, William S., Balmanno Castle, Bridge of Earn, Mare, "Eastertide" (26,108).

2nd No. 710 Jamieson, Robert, 45 High Street, Linlithgow, Filly, "Mannequin" (26,669).

DRAUGHT GELDING IN HARNESS.

CLASS 101. DRAUGHT GELDING, any age, in Harness, shown in Cart or Lorry (and driven by single driver), it being a condition that the Horse must have been regularly worked for a period of twelve weeks prior to the first day of the Show.—PRIZES, £10, £5, £3, and £2.

1st No. 715 Cunningham, J. & J., Ltd., 35 Charlotte Street, Leith.

2nd No. 469 Farquhar, Andrew, Middleton, Bowling, "Director."

3rd No. 458 Bowser, D. C., Mains of Argaty, Doune, "Barney."

4th No. 716 Cunningham, J. & J., Ltd., 35 Charlotte Street, Leith.

V No. 717 Cunningham, J. & J., Ltd., 35 Charlotte Street, Leith.

H No. 720 M'Gee, Robert, Blackfaulds, Sauchie, Alloa, "Bob."

C No. 719 M'Gee, Robert, Blackfaulds, Sauchie, Alloa, "Charlie."

JUMPING COMPETITIONS.

Champion Prize of £10 for the most points in Prizes with one Horse in Classes 1, 2, and 4.

CONDITIONS.—First Prize to count five points ; Second Prize, four points ; Third Prize, three points ; Fourth Prize, two points ; Fifth Prize, one point ; The money to be evenly divided in the event of a tie.

Macmasters, S.Q.M.S., F., Redford Barracks, Colinton (11 points).

CLASS 1. HORSE or PONY, any height.—PREMIUMS, £20, £15, £10, £5, and £3.

1st Macmasters, S.Q.M.S., F., Redford Barracks, Colinton, mare, "Mary."
 2nd Taylor, Joseph, Moss Hall, Stretton, Warrington, mare, "Gem."
 3rd Grange, F. V., Alveston, Nantwich, gelding, "Desire."
 4th Bradley, Ernest, Newton Grange, Great Ayton, mare, "Kitty."
 5th Reynard, J. N., Manuel House, Linlithgow, gelding, "Cockleroi."

CLASS 2. HORSE or PONY, any height, Handicap, hurdles and gate being raised 8 inches for the winner of the first prize, and 4 inches for the winner of the second prize in Class 1.—PREMIUMS, £20, £15, £10, £5, and £3.

1st Taylor, Joseph, Moss Hall, Stretton, Warrington, mare, "Gem."
 2nd Macmasters, S.Q.M.S., F., Redford Barracks, Colinton, mare, "Mary."
 3rd Grange, F. V., Alveston, Nantwich, gelding, "Desire."
 4th Patteson-Knight, D. H., Redford Barracks, Colinton, gelding, "Jeff."
 5th Bradley, Ernest, Newton Grange, Great Ayton, mare, "Kitty."

CLASS 3. HORSE or PONY, any height.—PREMIUMS, £10, £8, £5, £3, and £2.

1st	equal	{	Monks, T. & H., Holt Green, Aughton, Ormskirk, gelding,
			"Planet."
2nd			Grange, F. V., Alveston, Nantwich, Gelding, "Desire."
3rd	Allison, Frank, Mitre Hotel, Penrith, mare,		"Nettles."
4th	equal	{	Taylor, Joseph, Moss Hall, Stretton, Warrington, mare,
			"Gem."
5th			Macmasters, S.Q.M.S., F. Redford Barracks, Colinton, mare, "Prosper."
			Bradley, Ernest, Newton Grange, Great Ayton, mare, "Kitty."

CLASS 4. HORSE or PONY, any height, Handicap, hurdles and gate being raised 8 inches for the winner of the first prize, and 4 inches for the winner of the second prize in either of Classes 1 or 2—4 inches extra for the winner of the two first prizes in Classes 1 and 2.—PREMIUMS, £15 £10, £5, £3, and £2.

1st Allison, Frank, Mitre Hotel, Penrith, mare, "Nettles."
 2nd Grange, F. V., Alveston, Nantwich, gelding, "Desire."
 3rd Macmasters, S.Q.M.S., F., Redford Barracks, Colinton, mare, "Prosper."
 4th Macmasters, S.Q.M.S., F., Redford Barracks, Colinton, mare, "Mary."
 5th Bradley, Ernest, Newton Grange, Great Ayton, mare, "Kitty."

SHEEP.

BLACKFACE.

PRESIDENT'S CHAMPION MEDAL for best Blackface Sheep.

No. 730 Hamilton, M. G., Woolfords, Cobbinshaw, "Flockmaster."
Reserve—No. 748 Clark, William M., & Sons, Crossflatt, Muirkirk,
 "Lochlane."

Fife and Kinross Perpetual Gold Challenge Cup, value £200, for best *Blackface Sheep*, "*Extra Stock*" being eligible to compete. This Cup, along with an endowment of £400, was subscribed for by the Counties of Fife and Kinross in commemoration of the Society's first Show at Cupar-Fife in 1912.

No. 730 Hamilton, M. G., Woolfords, Cobbinshaw, "Flockmaster."
Reserve—No. 748 Clark, William M., & Sons, Crossflatt, Muirkirk,
 "Lochlane."

CLASS 102. TUP above one Shear.—PREMIUMS, £12, £8, £4, and £2.

- 1st No. 730 Hamilton, M. G., Woolfords, Cobbinshaw, "Flockmaster."
- 2nd No. 732 Hamilton, M. G. & J., Craigdarroch, Sanquhar, "Diplomat."
- 3rd No. 727 Clark, William M., & Sons, Crossflatt, Muirkirk, "Substantial."
- 4th No. 722 Anderson, W. W., Colzium, Kirknewton, "Earl of Home."
- V No. 737 Mitchell, William, Hazelside, Douglas, "Inverness II."
- H No. 731 Hamilton, M. G., Woolfords, Cobbinshaw, "Sunbeam."
- C No. 726 Clark, William M., & Sons, Crossflatt, Muirkirk, "Nameless Laddie."
- C No. 735 M'Laren, James, Shielbrae, Stirling.

CLASS 103. SHEARLING TUP.—PREMIUMS, £12, £8, £4, and £2.

- 1st No. 748 Clark, William M., & Sons, Crossflatt, Muirkirk, "Lochlane."
- 2nd No. 752 Hamilton, M. G., Woolfords, Cobbinshaw.
- 3rd No. 743 Black, J. Belfrage, Holton, Milnathort.
- 4th No. 772 Stewart, Robert, Crianlarich.
- V No. 768 Mitchell, William, Hazelside, Douglas.
- H No. 756 Hamilton, M. G., Woolfords, Cobbinshaw.
- C No. 753 Hamilton, M. G., Woolfords, Cobbinshaw.
- C No. 763 Marshall & Mitchell, Bleaton, Blairgowrie.
- C No. 766 Mitchell, William, Hazelside, Douglas.
- C No. 767 Mitchell, William, Hazelside, Douglas.

CLASS 104. SHEARLING TUP, which shall have been entirely outwintered, and not housed or house-fed at any time, and not clipped before 21st May 1929.—PREMIUMS, £12, £8, £4, and £2.

- 1st No. 781 Novar Estates, Limited, Novar, Evanton, Ross-shire.
- 2nd No. 784 Novar Estates, Limited, Novar, Evanton, Ross-shire.
- 3rd No. 776 Dickinson, R. & W. B., Tollishill, Oxtou, Berwickshire.
- 4th No. 780 Novar Estates, Limited, Novar, Evanton, Ross-shire.
- V No. 779 Novar Estates, Limited, Novar, Evanton, Ross-shire.
- H No. 774 Anderson, W. W., Colzium, Kirknewton.
- C No. 783 Novar Estates, Limited, Novar, Evanton, Ross-shire.

CLASS 105. TUP LAMB.—PREMIUMS, £5, £3, and £2.

- 1st No. 793 Rottenburg, F. A., Lochlane, Crieff.
 2nd No. 790 Black, J. Belfrage, Holton, Milnathort.
 3rd No. 785 Anderson, W. W., Colzium, Kirknewton.
 V No. 791 Marshall & Mitchell, Bleaton, Blairgowrie.
 H No. 788 Anderson, William, Craigends, Fenwick, Kilmarnock.
 C No. 794 Rottenburg, F. A., Lochlane, Crieff.

**CLASS 106. EWE, above one Shear, with her Lamb at foot.—
PREMIUMS, £10, £5, and £2.**

- 1st No. 805 M'Laren, James, Shielbrae, Stirling.
 2nd No. 803 Craig, William, Fallside, Lamington.
 3rd No. 804 Howison, A. W., Rannagulzion, Blairgowrie.
 V No. 806 M'Laren, James, Shielbrae, Stirling.
 H No. 796 Ancaster, The Earl of, Corrychrone, Callander,
 "Corrychrone Queen II."
 C No. 798 Anderson, W. W., Colzium, Kirknewton.
 C No. 801 Burton, W., Auchtertyre, Tyndrum.

**CLASS 107. SHEARLING EWE OR GIMMER.—PREMIUMS, £10,
£5, and £2.**

- 1st No. 826 Robson, John, Newton, Tarsset, Northumberland.
 2nd No. 822 Lindsay, William, Balintore, Kirriemuir.
 3rd No. 815 Black, J. Belfrage, Holton, Milnathort, "May Morn of
 Holton."
 V No. 816 Craig, William, Fallside, Lamington.
 H No. 824 M'Laren, James, Shielbrae, Stirling.
 C No. 813 Anderson, William, Craigends, Fenwick, Kilmarnock,
 "Irene 2nd."
 C No. 814 Black, J. Belfrage, Holton, Milnathort, "Lady Holton."

CHEVIOT.*PRESIDENT'S CHAMPION MEDAL for best Cheviot Sheep.*

- No. 904 Hogg, George, Penmanshiel, Grantshouse.
 Reserve—No. 863 Robson, John, Millknowe, Duns

CLASS 108. TUP above one Shear.—PREMIUMS, £12, £8, £4, and £2.

- 1st No. 833 Elliot, Robert T., Chatto, Jedburgh.
 2nd No. 836 Elliot, Thomas R., Attonburn, Kelso.
 3rd No. 838 Robson, John, Millknowe, Duns, "Lord Eskdale."
 4th No. 832 Elliot, George, Brockdam, Chathill, Northumberland,
 "First Home."
 V No. 831 Elliot, Arthur, Hindhope, Jedburgh.
 H No. 839 Thomson, Messrs, Bushelhill, Cockburnspath, "Gallant
 Davie."
 C No. 835 Elliot, Thomas R., Attonburn, Kelso.

CLASS 109. SHEARLING TUP.—PREMIUMS, £12, £8, £4, and £2.

- 1st No. 863 Robson, John, Millknowe, Duns.
 2nd No. 858 Hogg, William, Newlands, Gifford.
 3rd No. 848 Elliot, John, Blackhaugh, Clovenfords.
 4th No. 856 Hogg, George, Penmanshiel, Grantshouse.
 V No. 868 Thorburn & Grieve, Glenormiston, Innerleithen.
 H No. 865 Thomson, Messrs, Bushelhill, Cockburnspath, "Aberdonian."
 C No. 844 Elliot, Arthur, Hindhope, Jedburgh.
 C No. 847 Elliot, John, Blackhaugh, Clovenfords.
 C No. 857 Hogg, William, Newlands, Gifford.

CLASS 110. TUP LAMB.—PREMIUMS, £5, £3, and £2.

- 1st No. 873 Elliot, John, Blackhaugh, Clovenfords.
 2nd No. 878 Hogg, George, Penmanshiel, Grantshouse.
 3rd No. 879 Hogg, George, Penmanshiel, Grantshouse.
 V No. 885 Thomson, Messrs, Bushelhill, Cockburnspath.
 H No. 880 Hogg, William, Newlands, Gifford.
 C No. 877 Elliot, Thomas R., Attonburn, Kelso.
 C No. 872 Elliot, George, Brockdam, Chathill, Northumberland.
 C No. 874 Elliot, John, Blackhaugh, Clovenfords.

**CLASS 111. EWE, above one Shear, with her Lamb at foot.—
PREMIUMS, £10, £5, and £2.**

- 1st No. 891 Elliot, Thomas R., Attonburn, Kelso.
 2nd No. 894 Thomson, Messrs, Bushelhill, Cockburnspath.
 3rd No. 895 Thorburn & Grieve, Glenormiston, Innerleithen.
 V No. 890 Elliot, Thomas R., Attonburn, Kelso.
 H No. 889 Elliot, Robert T., Chatto, Jedburgh.
 C No. 893 Thomson, Messrs, Bushelhill, Cockburnspath, "Lady Laidlaw."

CLASS 112. SHEARLING EWE OR GIMMER.—PREMIUMS, £10, £5, and £2.

- 1st No. 904 Hogg, George, Penmanshiel, Grantshouse.
 2nd No. 899 Elliot, George, Brockdam, Chathill, Northumberland.
 3rd No. 912 Thorburn & Grieve, Glenormiston, Innerleithen.
 V No. 905 Hogg, George, Penmanshiel, Grantshouse.
 H No. 906 Linton, George, Pathhead, Dunbar.
 C No. 896 Armstrong, Thomas, East Cote, Hawick.
 C No. 898 Elliot, Arthur, Hindhope, Jedburgh.

BORDER LEICESTER.*PRESIDENT'S CHAMPION MEDAL for best Border Leicester Sheep.*

- No. 980 Howie, James, Hillhouse, Kilmarnock.
 Reserve—No. 917 Dickinson, R. & W. B., Longcroft, Oxton, Berwickshire, "Bonnie Doone" (7513).

Gold Medal for best *Male animal in the Border Leicester Classes, registered or eligible for registration in the Border Leicester Flock-Book. Animals entered as "Extra Stock" not eligible.* Given by the Society of Border Leicester Sheep Breeders.

No. 917 Dickinson, R. & W. B., Longcroft, Oxton, Berwickshire,
"Bonnie Doone" (7513).

CLASS 113. TUP, above one Shear.—PREMIUMS, £12, £8, £4, and £2.

1st No. 917 Dickinson, R. & W. B., Longcroft, Oxton, Berwickshire,
"Bonnie Doone" (7513).

2nd No. 918 Howie, James, Hillhouse, Kilmarnock, "Remarkable"
(8064).

3rd No. 915 Cross, Robert, Knockdon, Maybole, "Ganymede" (7949).

4th No. 920 Melrose, A. J., Hordley, Woodstock, Oxon., "Satisfaction"
(7383).

V No. 921 Milne, William M., Balbinny, Forfar, "Perfect Gentleman"
(7705).

H No. 916 Dickinson, R. & W. B., Longcroft, Oxton, Berwickshire,
"Border Emblem" (7161).

C No. 919 Macbeth, W. Gilchrist, of Dunira, Comrie, "Hayston
Recruit" (7963).

CLASS 114. SHEARLING TUP.—PREMIUMS, £12, £8, £4, and £2.

1st No. 928 Dickinson, R. & W. B., Longcroft, Oxton, Berwickshire.

2nd No. 931 Findlay, Alexander, Hatton, Newtyle.

3rd No. 925 Cochran, Alexander, Nether Craig, Kilmarnock, "Better
Still" (7828).

4th No. 926 Cross, Robert, Knockdon, Maybole, "Superb" (8106).

V No. 930 Dickinson, R. & W. B., Longcroft, Oxton, Berwickshire.

H No. 923 Clark, J. G. D. (late Luggate), Eastfield, Whittingehame,
Haddington.

C No. 924 Clark, J. G. D. (late Luggate), Eastfield, Whittingehame,
Haddington.

C No. 936 Melrose, A. J., Hordley, Woodstock, Oxon.

C No. 938 Milne, William M., Balbinny, Forfar.

C No. 939 Niven, Alexander, Ayton, Newburgh.

CLASS 115. TUP LAMB.—PREMIUMS, £5, £3, and £2.

1st No. 945 Dickinson, R. & W. B., Longcroft, Oxton, Berwickshire.

2nd No. 948 Howie, James, Hillhouse, Kilmarnock.

3rd No. 957 Young, John, Skerrington Mains, Hurlford.

V No. 947 Findlay, Alexander, Hatton, Newtyle.

H No. 959 Young, John, Skerrington Mains, Hurlford.

C No. 950 Howie, James, Hillhouse, Kilmarnock.

C No. 958 Young, John, Skerrington Mains, Hurlford.

Gold Medal for best *Female Animal in the Border Leicester Classes, registered or eligible for registration in the Border Leicester Flock-Book. Animals entered as "Extra Stock" not eligible.* Given by the Society of Border Leicester Sheep-Breeders.

No. 980 Howie, James, Hillhouse, Kilmarnock.

CLASS 116. EWE, above one Shear.—PREMIUMS, £10, £5, and £2.

- 1st No. 963 Howie, James, Hillhouse, Kilmarnock, C 3 (BL 245).
 2nd No. 966 Melrose, A. J., Hordley, Woodstock, Oxon.
 3rd No. 969 Stewart, John, Woodburne, Ceres, Cupar, Fife.
 V No. 967 Milne, William M., Balbinny, Forfar.
 H No. 970 Whyte, James, Hayston, Glamis, Angus.
 C No. 968 Niven, Alexander, Ayton, Newburgh.
 C No. 971 Young, John, Skerrington Mains, Hurlford.

**CLASS 117. SHEARLING EWE or GIMMER.
—PREMIUMS, £10, £5, and £2.**

- 1st No. 980 Howie, James, Hillhouse, Kilmarnock.
 2nd No. 991 Young, John, Skerrington Mains, Hurlford.
 3rd No. 979 Howie, James, Hillhouse, Kilmarnock.
 V No. 982 Macbeth, W. Gilchrist, of Dunira, Comrie.
 H No. 981 Howie, James, Jun., Eglinton Mains, Irvine.
 C No. 977 Dickinson, R. & W. B., Longcroft, Oxton, Berwickshire.
 C No. 984 Melrose, A. J., Hordley, Woodstock, Oxon.
 C No. 987 Niven, Alexander, Ayton, Newburgh.

CLASS 118. EWE LAMB.—PREMIUMS, £5, £3, and £2.

- 1st No. 1005 Young, John, Skerrington Mains, Hurlford.
 2nd No. 997 Howie, James, Jun., Eglinton Mains, Irvine.
 3rd No. 1006 Young, John, Skerrington Mains, Hurlford.
 V No. 995 Howie, James, Hillhouse, Kilmarnock.
 H No. 999 Macbeth, W. Gilchrist, of Dunira, Comrie.
 C No. 993 Cochrane, Alexander, Nether Craig, Kilmarnock.
 C No. 994 Findlay, Alexander, Hatton, Newtyle.

HALF-BRED.**PRESIDENT'S CHAMPION MEDAL for best pen of Half-Bred Sheep.**

No. 1010 Butters, James, Masterton, Dunfermline.

Reserve—No. 1007 Armstrong, Thomas, East Cote, Hawick.

CLASS 119. SHEARLING TUP.—PREMIUMS, £10, £7, and £3.

- 1st No. 1007 Armstrong, Thomas, East Cote, Hawick.
 2nd No. 1008 Armstrong, Thomas, East Cote, Hawick.

CLASS 120. EWE above one Shear.—PREMIUMS, £10, £5, and £2.

- 1st No. 1010 Butters, James, Masterton, Dunfermline.
 2nd No. 1013 M'Laren, William, Fairnington, Roxburgh.
 3rd No. 1009 Armstrong, Thomas, East Cote, Hawick.
 V No. 1012 Elder, Hugh, Bughtknowe, Humble, East Lothian.
 H No. 1011 Elder, Hugh, Bughtknowe, Humble, East Lothian.
 C No. 1014 M'Laren, William, Fairnington, Roxburgh

CLASS 121. SHEARLING EWE or GIMMER.—PREMIUMS, £10, £5, and £2.

- 1st No. 1018 Brown, John C., Hundalee, Jedburgh.
 2nd No. 1016 Brown, John C., Hundalee, Jedburgh.
 3rd No. 1020 Elder, Hugh, Bughtknowe, Humble, East Lothian.
 V No. 1022 M'Laren, William, Fairnington, Roxburgh.
 H No. 1024 M'Laren, William, Fairnington, Roxburgh.
 C No. 1021 Elder, Hugh, Bughtknowe, Humble, East Lothian.

CLASS 122. THREE EWE LAMBS.—PREMIUMS, £5, £3, and £2.

- 1st No. 1025 Armstrong, Thomas, East Cote, Hawick.
 2nd No. 1026 Elder, Hugh, Bughtknowe, Humble, East Lothian.

OXFORD-DOWN.*PRESIDENT'S CHAMPION MEDAL for best pen of Oxford-Down Sheep.*

- No. 1030 Malcolm, William T., Whittingehame Mains, Haddington.
 Reserve—No. 1053 Templeton, T. & M., Sandyknowe, Kelso.

Scottish Oxford-Down Sheep-Breeders' Challenge Bowl, value £50, for the best Oxford-Down animal bred in Scotland, to be won three times by the same owner, but with different sheep, before becoming his property—given by Oxford-Down Sheep-Breeders' Association.

- No. 1036 Malcolm, William M., Softlaw, Kelso.

CLASS 123. SHEARLING TUP.—PREMIUMS, £8, £5, and £3.

- 1st No. 1030 Malcolm, William T., Whittingehame Mains, Haddington.
 2nd No. 1031 Templeton, T. & M., Sandyknowe, Kelso.
 3rd No. 1028 Malcolm, William M., Softlaw, Kelso.
 V No. 1032 Templeton, T. & M., Sandyknowe, Kelso.
 H No. 1027 Harrison, John & R., Gainford Hall, Gainford, Co. Durham.
 C No. 1033 Templeton, T. & M., Sandyknowe, Kelso.

CLASS 124. SHEARLING EWE or GIMMER.—PREMIUMS, £8, £5, and £3.

- 1st No. 1036 Malcolm, William M., Softlaw, Kelso.
 2nd No. 1040 Templeton, T. & M., Sandyknowe, Kelso.
 3rd No. 1037 Malcolm, William M., Softlaw, Kelso.
 V No. 1039 Templeton, T. & M., Sandyknowe, Kelso.
 H No. 1034 Lawson, William H., Frithfield, Anstruther.
 C No. 1035 Lawson, William H., Frithfield, Anstruther.

CLASS 125. TUP LAMB.—PREMIUMS, £8, £5, and £3.

- 1st No. 1048 Templeton, T. & M., Sandyknowe, Kelso.
 2nd No. 1047 Templeton, T. & M., Sandyknowe, Kelso.
 3rd No. 1044 Malcolm, William M., Softlaw, Kelso.
 V No. 1049 Templeton, T. & M., Sandyknowe, Kelso.
 H No. 1041 Harrison, John & R., Gainford Hall, Gainford, Co. Durham.
 C No. 1043 Lawson, William H., Frithfield, Anstruther.

CLASS 126. THREE EWE LAMBS.—PREMIUMS, £8, £5 and £2.

- 1st No. 1053 Templeton, T. & M., Sandyknowe, Kelso.
 2nd No. 1051 Malcolm, William M., Softlaw, Kelso.
 3rd No. 1050 Lawson, William H., Frithfield, Anstruther.
 V No. 1052 Malcolm, William T., Whittingehame Mains, Haddington.

SUFFOLK.*PRESIDENT'S CHAMPION MEDAL for best pen of Suffolk Sheep.*

No. 1061 Golightly, William, Whitelaw, Haddington.

Reserve—No. 1072 Prince-Smith, Sir Prince, Bart., Southburn House,
 Driffield, East Yorks.

CLASS 127. TUP, one Shear and over.—PREMIUMS, £8, £5, and £3.

- 1st No. 1056 Golightly, William, Whitelaw, Haddington.
 2nd No. 1054 Duncan, Commander J. A., Parkhill, Arbroath.
 V No. 1055 Fraser, Hugh, Linton Burnfoot, Kelso.

CLASS 128. SHEARLING EWE or GIMMER.—PREMIUMS, £8, £5, and £3.

- 1st No. 1061 Golightly, William, Whitelaw, Haddington.
 2nd No. 1058 Duncan, Commander J. A., Parkhill, Arbroath.
 3rd No. 1062 Golightly, William, Whitelaw, Haddington.
 V No. 1063 Stodart, Charles, Leaston, Humbie.
 H No. 1057 Duncan, Commander J. A., Parkhill, Arbroath.
 C No. 1060 Fraser, Hugh, Linton Burnfoot, Kelso.
 C No. 1064 Stodart, Charles, Leaston, Humbie.

CLASS 129. TUP LAMB.—PREMIUMS, £8, £5, and £3.

- 1st No. 1072 Prince-Smith, Sir Prince, Bart., Southburn House,
 Driffield, East Yorks.
 2nd No. 1073 Prince-Smith, Sir Prince, Bart., Southburn House,
 Driffield, East Yorks.
 3rd No. 1075 Rintoul, William, Pratis, Leven.
 V No. 1074 Prince-Smith, Sir Prince, Bart., Southburn House,
 Driffield, East Yorks.
 H No. 1070 Golightly, William, Whitelaw, Haddington.
 C No. 1066 Duncan, Commander J. A., Parkhill, Arbroath.
 C No. 1071 Golightly, William, Whitelaw, Haddington.
 C No. 1065 Duncan, Commander J. A., Parkhill, Arbroath.
 C No. 1067 Duncan, Commander J. A., Parkhill, Arbroath.
 C No. 1076 Stodart, Charles, Leaston, Humbie.
 C No. 1077 Stodart, Charles, Leaston, Humbie.
 C No. 1078 Whitton, R. & W., Dunkenny, Eassie, Angus.
 C No. 1079 Whitton, R. & W., Dunkenny, Eassie, Angus.

CLASS 130. THREE EWE LAMBS.—PREMIUMS, £8, £5, and £2.

- 1st No. 1084 Rintoul, William, Pratis, Leven.
 2nd No. 1083 Prince-Smith, Sir Prince, Bart., Southburn House,
 Driffeld, East Yorks.
 3rd No. 1080 Duncan, Commander J. A., Parkhill, Arbroath.
 V No. 1086 Whitton, R. & W., Dunkenny, Eassie, Angus.
 H No. 1082 Golightly, William, Whitelaw, Haddington.
 C No. 1085 Stodart, Charles, Leaston, Humber.
 C No. 1087 Whitton, R. & W., Dunkenny, Eassie, Angus.

SHROPSHIRE.*PRESIDENT'S CHAMPION MEDAL for best Shropshire Sheep.*

- No. 1090 Buttar, Thomas A., Corston, Coupar-Angus.
Reserve—No. 1093 Buttar, Thomas A., Corston, Coupar-Angus.

CLASS 131. TUP, any age.—PREMIUMS, £6, £4, and £2.

- 1st No. 1090 Buttar, Thomas A., Corston, Coupar-Angus.
 2nd No. 1089 Buttar, Thomas A., Corston, Coupar-Angus.
 3rd No. 1088 Buttar, Thomas A., Corston, Coupar-Angus.

CLASS 132. EWE or GIMMER.—PREMIUMS, £5, £3, and £2.

- 1st No. 1093 Buttar, Thomas A., Corston, Coupar-Angus.
 2nd No. 1094 Buttar, Thomas A., Corston, Coupar-Angus.
 3rd No. 1095 Buttar, Thomas A., Corston, Coupar-Angus.

DORSET HORN.*PRESIDENT'S CHAMPION MEDAL for best Dorset Horn Sheep.*

- No. 1112 Elgin and Kincardine, The Earl of, C.M.G., Broomhall,
 Dunfermline (451).
Reserve—No. 1101 Elgin and Kincardine, The Earl of, C.M.G., Broom-
 hall, Dunfermline, "Broomhall No. 3" (5100).

CLASS 133. TUP, any age.—PREMIUMS, £6, £4, and £2.

- 1st No. 1101 Elgin and Kincardine, The Earl of, C.M.G., Broomhall,
 Dunfermline, "Broomhall No. 3" (5100).
 2nd No. 1099 Cochrane, Lieut.-Colonel Lord, of Cults, Crawford Priory,
 Springfield, Fife.
 3rd No. 1100 Cochrane, Lieut.-Colonel Lord, of Cults, Crawford Priory,
 Springfield, Fife, "Wellow No. 177" (5804).
 V No. 1102 Elgin and Kincardine, The Earl of, C.M.G., Broomhall,
 Dunfermline, "Broomhall No. 7."
 H No. 1097 Bruce, Lord, Broomhall, Dunfermline, "Broomhall No. 8."

CLASS 134. EWE or GIMMER.—PREMIUMS, £5, £3, and £2.

- 1st No. 1112 Elgin and Kincardine, The Earl of, C.M.G., Broomhall, Dunfermline (451).
 2nd No. 1107 Bruce, Lord, Broomhall, Dunfermline.
 3rd No. 1113 Elgin and Kincardine, The Earl of, C.M.G., Broomhall, Dunfermline (451).
 V No. 1106 Bruce, Lord, Broomhall, Dunfermline (451).
 H No. 1111 Cochrane, Lieut.-Colonel Lord, of Cults, Crawford Priory, Springfield, Fife.
 C No. 1104 Beveridge, Charles H., Elphinstone Tower, Tranent.
 C No. 1110 Cochrane, Lieut.-Colonel Lord, of Cults, Crawford Priory, Springfield, Fife.

FAT SHEEP.**CLASS 135. THREE FAT LAMBS, any Breed or Cross dropped in the year of the Show.—PREMIUMS, £5, £3, and £2.**

- 1st No. 1122 Elgin and Kincardine, The Earl of, C.M.G., Broomhall, Dunfermline (South Down Tup and Dorset Horn Ewes).
 2nd No. 1120 Crawford, William, Hatton Mains, Kirknewton, Mid-Lothian (Suffolk Tup and Border Leicester-Blackface Cross Ewes).
 3rd No. 1116 Beveridge, Charles H., Elphinstone Tower, Tranent (Suffolk Tup and Half-bred Ewes).
 V No. 1117 Bruce, Lord, Broomhall, Dunfermline (South Down Tup and Dorset Down Ewes).
 H No. 1123 Horn, Miss J. V., Woodcote Park, Blackshiels, Mid-Lothian (Black Welsh Mountain).
 C No. 1119 Crawford, William, Hatton Mains, Kirknewton, Mid-Lothian (Suffolk Tup and Half-bred Ewes).

CLASS 136. THREE FAT LAMBS, out of Blackface Ewes, dropped on or after 1st March of the year of the Show.—PREMIUMS, £5, £3, and £2.*(No Entry).*

GOATS.

PRESIDENT'S CHAMPION MEDAL for best Animal in the Goat Classes.

No. 1125 Forteviot, Lady, Dupplin Castle, Perth (British Alpine),
"Dupplin Abbotspeed" (8692).

Reserve—No. 1132 Henderson, Miss Marjorie, The Riding, Hexham
(British Alpine), "Riding Thistle Bud" (7523).

The Competition for Goats is recognised by the British Goat Society,
which will give Challenge Certificates (qualifying for a Championship).—

For the best Male Goat over one year.

No. 1125 Forteviot, Lady, Dupplin Castle, Perth (British Alpine),
"Dupplin Abbotspeed" (8692).

For the best Female Goat over two years that has borne a kid.

No. 1132 Henderson, Miss Marjorie, The Riding, Hexham (British
Alpine), "Riding Thistle Bud" (7523).

For the best dual purpose Goat over two years that has borne a kid.

No. 1133 Forteviot, Lady, Dupplin Castle, Perth (Anglo-Swiss),
"Dupplin Dale*" (6959).

A Bronze Medal for the best Female exhibit in Classes 140, 141, 142 and 143.

No. 1132 Henderson, Miss Marjorie, The Riding, Hexham (British
Alpine), "Riding Thistle Bud" (7523).

A Bronze Medal for the best Male exhibit in Classes 137, 138 and 139.

No. 1125 Forteviot, Lady, Dupplin Castle, Perth (British Alpine),
"Dupplin Abbotspeed" (8692).

Forteviot Challenge Cup, value £30, offered by the British Goat Society
*for the best Goat, irrespective of sex or age, entered in either the British
Alpine, British Saanen, or British Toggenburg Sections of the Herd-Book.*

No. 1131 Forteviot, Lady, Dupplin Castle, Perth (British Alpine),
"Dupplin Delight" (8080).

Challenge Cup, value 20 Guineas, *for the best Female Goat in the Show—
given by Lord Dewar, London.*

No. 1132 Henderson, Miss Marjorie, The Riding, Hexham (British
Alpine), "Riding Thistle Bud" (7523).

Challenge Cup, value £10, *for best Female Anglo-Nubian Goat over two
years old, in Milk, entered in the Anglo-Nubian Section of the Herd-
Book, "Extra Stock" being eligible to compete—given by Mrs S.
Macdonald, Garrochty,*

(No Entry),

CLASS 137. MALE GOAT, any Variety, over two years.
—PREMIUMS, £3, £2, and £1.

(No Entry).

CLASS 138. MALE GOAT, any Variety, over one but not exceeding two years.—PREMIUMS, £3, £2, and £1.

1st No. 1125 Forteviot, Lady, Dupplin Castle, Perth (British Alpine),
"Dupplin Abbotspeed" (8692).

CLASS 139. MALE KID, any Variety, not exceeding one year.—
PREMIUMS, £3, £2, and £1.

1st No. 1127 Forteviot, Lady, Dupplin Castle, Perth (British Alpine),
"†Dupplin Baksheesh" (9070).

2nd No. 1128 Henderson, Miss Marjorie, The Riding, Hexham (British Alpine), "Riding Demon" (9171).

3rd No. 1129 Wallace, Mrs, Nethermoss, Rumbling Bridge (British Cross-bred) "Royalty" (9236).

CLASS 140. FEMALE GOAT, Toggenburg, British Toggenburg, Saanen, British Saanen, or British Alpine, in Milk.—PREMIUMS, £3, £2, and £1.

1st No. 1132 Henderson, Miss Marjorie, The Riding, Hexham (British Alpine), "Riding Thistle Bud" (7523).

2nd No. 1131 Forteviot, Lady, Dupplin Castle, Perth (British Alpine),
"Dupplin Delight" (8080).

3rd No. 1130 Forteviot, Lady, Dupplin Castle, Perth (British Toggenburg), "Dupplin Dusk Q*" (7017).

CLASS 141. FEMALE GOAT, any other Variety, in Milk.
—PREMIUMS, £3, £2, and £1.

1st No. 1133 Forteviot, Lady, Dupplin Castle, Perth (Anglo-Swiss),
"Dupplin Dale*" (6959).

2nd No. 1135 Monaghan, Thomas, Queen Victoria School, Dunblane (Anglo-Nubian-Swiss), "Vivienne" (8176).

3rd No. 1134 Henderson, Miss Marjorie, The Riding, Hexham (British),
"Riding Tottie Q* Q* Q* Q*" (7525).

CLASS 142. GOATLING, any Variety, over one but not exceeding two years.—PREMIUMS, £3, £2, and £1.

1st No. 1139 Forteviot, Lady, Dupplin Castle, Perth (Anglo-Swiss),
"Dupplin Appleblossom" (8600).

2nd No. 1142 Forteviot, Lady, Dupplin Castle, Perth (British Alpine),
"Dupplin Amy" (8694).

3rd No. 1137 Colman, Edward, Haugh House, Craigie, Perth (British Cross-bred), "Sheena" (8589).

V No. 1146 Wallace, Mrs, Nethermoss, Rumbling Bridge (British Cross-bred), "Perena" (8588).

H No. 1140 Forteviot, Lady, Dupplin Castle, Perth (British Toggenburg), "Dupplin Angela" (8594).

C No. 1141 Forteviot, Lady, Dupplin Castle, Perth (British Alpine),
"Dupplin Amabel" (8693).

C No. 1145 Swan, Miss Elinor, Swanston Cottage, Colinton, Mid-Lothian (British-Toggenburg Type), "Wendy of Swanston" (SR 474).

CLASS 143. FEMALE KID, any Variety, not exceeding one year.
 —PREMIUMS, £3, £2, and £1.

- 1st No. 1151 Forteviot, Lady, Dupplin Castle, Perth (Anglo-Swiss),
 "Prop of Bashley" (9031).
 2nd No. 1150 Colman, Edward, Haugh House, Craigie, Perth (British
 Cross-Bred), "Shasta" (9067).
 3rd No. 1156 Monaghan, Thomas, Queen Victoria School, Dunblane
 (Anglo-Nubian-Swiss), "Thorah" (9149).
 V No. 1157 Swan, Miss Elinor, Swanston Cottage, Colinton, Mid-
 Lothian (British-Toggenburg Type), "Rosette of
 Swanston" (SR 475).
 H No. 1152 Forteviot, Lady, Dupplin Castle, Perth (Anglo-Swiss),
 "Property of Bashley" (9032).
 C No. 1153 Forteviot, Lady, Dupplin Castle, Perth (British Alpine),
 "Dupplin Buttercup" (9115).
 C No. 1155 Henderson, Miss Marjorie, The Riding, Hexham (British
 Alpine), "Riding Tangle" (9173).

**CLASS 144. MILKING COMPETITION, for quality, open to Classes
 140 and 141.—PREMIUMS, £3, £2, and £1.**

- 1st No. 1134 Henderson, Miss Marjorie, The Riding, Hexham (British),
 "Riding Tottie Q* Q* Q* Q*" (7525).
 2nd No. 1133 Forteviot, Lady, Dupplin Castle, Perth (Anglo-Swiss),
 "Dupplin Dale*" (6959).
 3rd No. 1131 Forteviot, Lady, Dupplin Castle, Perth (British Alpine),
 "Dupplin Delight" (8080).

**CLASS 145. MILKING COMPETITION, for quantity, open to Classes
 140 and 141.—PREMIUMS, £3, £2, and £1.**

- 1st No. 1133 Forteviot, Lady, Dupplin Castle, Perth (Anglo-Swiss),
 "Dupplin Dale*" (6959).
 2nd No. 1131 Forteviot, Lady, Dupplin Castle, Perth (British Alpine),
 "Dupplin Delight" (8080).
 3rd No. 1134 Henderson, Miss Marjorie, The Riding, Hexham (British),
 "Riding Tottie Q* Q* Q* Q*" (7525).

PIGS.

LARGE WHITE.

PRESIDENT'S CHAMPION MEDAL for best Large White Pig.

No. 1196 Daresbury, Lord, C.V.O., Walton Hall, Warrington, "Peakirk Mary 5th" (160,130).

Reserve—No. 1207 Daresbury, Lord, C.V.O., Walton Hall, Warrington, "Walton Lassie 38th."

CLASS 146. BOAR, born before 1928.—PREMIUMS, £8, £4, and £2.

1st No. 1162 Daresbury, Lord, C.V.O., Walton Hall, Warrington, "Peakirk Bob 7th" (57,455).

2nd No. 1167 Wallace, Captain A. A., Halbeath House, Halbeath, Dunfermline, "Wall Jay 14th" (62,425).

3rd No. 1166 Morgan, J. Pierpont, Wall Hall, Watford, "Aldenhams Brigadier" (55,669).

V No. 1161 Cowper, John E. B., Gogar Mains, Corstorphine, "Ford King David 6th" (60,791).

H No. 1163 Elder, A. J., City Mills, Dunfermline, "Tockwith Jay 9th" (57,989).

CLASS 147. BOAR, born in 1928.—PREMIUMS, £8, £4, and £2.

1st No. 1171 Daresbury, Lord, C.V.O., Walton Hall, Warrington, "Walton Boy 39th" (66,159).

2nd No. 1176 Thomlinson, E., Hall Farm, Hutton Wandesley, Marston, York, "Tockwith Prince George 13th."

3rd No. 1174 Hallas, W., Bank House Farm, Helsby, Warrington, "Hallastone Victor 26th" (65,139).

V No. 1175 Morgan, J. Pierpont, Wall Hall, Watford, "Aldenhams Bombardier."

H No. 1173 Haig, Alastair N., Springfield Farm, Kinross, "Walton Turk 47th" (66,233).

CLASS 148. BOAR, born in 1929.—PREMIUMS, £6, £3, and £1.

1st No. 1184 Daresbury, Lord, C.V.O., Walton Hall, Warrington, "Walton Bob 2nd."

2nd No. 1192 Thomlinson, E., Hall Farm, Hutton Wandesley, Marston, York, "Tockwith Jay 20th."

3rd No. 1187 Forteviot, Lord, Dupplin Castle, Perth, "Dupplin Jay 19th."

V No. 1183 Daresbury, Lord, C.V.O., Walton Hall, Warrington, "Walton Jay 32nd."

H No. 1195 Wallace, Captain A. A., Halbeath House, Halbeath, Dunfermline (Ear No. 715).

C No. 1185 Elder, A. J., City Mills, Dunfermline (Ear No. 123).

CLASS 149. SOW, born before 1928.—PREMIUMS, £8, £4, and £2.

- 1st No. 1196 Daresbury, Lord, C.V.O., Walton Hall, Warrington, "Peakirk Mary 5th" (160,130).
 2nd No. 1204 Morgan, J. Pierpont, Wall Hall, Watford, "Aldenham Belle 72nd" (178,388).
 3rd No. 1202 Leitch, Messrs, Inchstelly, Alves, Forres, "Inchstelly Maggie 230th" (159,078).
 V No. 1197 Elder, A. J., City Mills, Dunfermline, "Halbeath Jewel 3rd" (158,380).
 C No. 1199 Forteviot, Lord, Dupplin Castle, Perth, "Dupplin Violet 3rd" (157,768).

CLASS 150. SOW, born in 1928.—PREMIUMS, £8, £4, and £2.

- 1st No. 1207 Daresbury, Lord, C.V.O., Walton Hall, Warrington, "Walton Lassie 38th."
 2nd No. 1213 Morgan, J. Pierpont, Wall Hall, Watford, "Aldenham Queen 34th."
 3rd No. 1215 Thomlinson, E., Hall Farm, Hutton Wandesley, Marston, York, "Tockwith Blackberry 8th."
 V No. 1214 Thomlinson, E., Hall Farm, Hutton Wandesley, Marston, York, "Tockwith Blackberry 6th."
 H No. 1206 Daresbury, Lord, C.V.O., Walton Hall, Warrington, "Walton Bashful Lady 5th" (182,540).
 C No. 1209 Hallas, W., Bank House Farm, Helsby, Warrington, "Whittingham Madam 23rd."

CLASS 151. SOW, born in 1929.—PREMIUMS, £6, £3, and £1.

- 1st No. 1233 Thomlinson, E., Hall Farm, Hutton Wandesley, Marston, York, "Tockwith Miss 24th" (Ear No. 2540).
 2nd No. 1223 Daresbury, Lord, C.V.O., Walton Hall, Warrington, "Walton Queen Mary 10th."
 3rd No. 1235 Wallace, Captain A. A., Halbeath House, Halbeath, Dunfermline (Ear No. 735).
 V No. 1229 Hallas, W., Bank House Farm, Helsby, Warrington, "Hallastone Jess 2nd."
 H No. 1226 Forteviot, Lord, Dupplin Castle, Perth, "Dupplin Catalina 61st."
 C No. 1227 Forteviot, Lord, Dupplin Castle, Perth, "Dupplin Catalina 64th."

MIDDLE WHITE.**PRESIDENT'S CHAMPION MEDAL for best Middle White Pig.**

- No. 1243 Hallas, W., Bank House Farm, Helsby, Warrington, "Ashtonheyes Monadelphia" (174,202).

- Reserve*—No. 1244 Smith-Sligo, Captain R. W., Inzievar, Oakley, Fife, "Inzievar Cressida" (118,372).

CLASS 152. BOAR, born before 1929.—PREMIUMS, £8, £4, and £2.

- 1st No. 1237 Hallas, W., Bank House Farm, Helsby, Warrington,
 "Hallstone Marquis 20th" (63,251).
 2nd No. 1236 Astor, Lady Violet, Meikleour Pig Herd, Blairgowrie,
 "Meikleour Beau 2nd."

CLASS 153. BOAR, born in 1929.—PREMIUMS, £6, £3, and £1.

- 1st No. 1239 Astor, Lady Violet, Meikleour Pig Herd, Blairgowrie,
 "Meikleour Victor."
 2nd No. 1240 Hallas, W., Bank House Farm, Helsby, Warrington,
 "Hallstone Marquis 25th."
 3rd No. 1241 Smith-Sligo, Captain R. W., Inzievar, Oakley, Fife.

CLASS 154. SOW, born before 1928.—PREMIUMS, £8, £4, and £2.

- 1st No. 1243 Hallas, W., Bank House Farm, Helsby, Warrington,
 "Ashtonheyes Monadelphia" (174,202).
 2nd No. 1244 Smith-Sligo, Captain R. W., Inzievar, Oakley, Fife.
 "Inzievar Cressida" (118,372).

CLASS 155. SOW, born in 1928.—PREMIUMS, £8, £4, and £2.

- 2nd No. 1245 Smith-Sligo, Captain R. W., Inzievar, Oakley, Fife,
 "Inzievar Nymph 3rd."

CLASS 156. SOW, born in 1929.—PREMIUMS, £6, £3, and £1.

- 1st No. 1247 Hallas, W., Bank House Farm, Helsby, Warrington,
 "Hallstone Pride 7th."
 2nd No. 1246 Astor, Lady Violet, Meikleour Pig Herd, Blairgowrie,
 "Meikleour Sheila 2nd."
 3rd No. 1248 Hallas, W., Bank House Farm, Helsby, Warrington,
 "Hallstone Pride 8th."
 V No. 1249 Smith-Sligo, Captain R. W., Inzievar, Oakley, Fife.
 H No. 1250 Smith-Sligo, Captain R. W., Inzievar, Oakley, Fife.

LARGE BLACK.**PRESIDENT'S CHAMPION MEDAL for best Large Black Pig.**

- No. 1285 Woolland, Walter, Baydon Manor, Ramsbury, Marlborough,
 "Baydon Nightingale 52nd" (E 162).

Reserve—No. 1257 Woolland, Walter, Baydon Manor, Ramsbury,
 Marlborough, "Redmarley Perfection" (B 247).

Silver Challenge Cup, value 12 Guineas, for best Large Black Boar or
 Sow owned by an Exhibitor resident in Scotland—given by Large
 Black Pig Society.

- No. 1281 M'Caig & Goodchild, Foreside of Cairn, Forfar, "Yam Erica
 1st" (E 212).

Silver Medal for the best Large Black Boar—given by Large Black Pig
 Society.

- No. 1257 Woolland, Walter, Baydon Manor, Ramsbury, Marlborough,
 "Redmarley Perfection" (B 247).

CLASS 157. BOAR, born before 1929.—PREMIUMS, £8, £4, and £2.

- 1st No. 1251 Dartmouth, The Earl of, P.C., K.C.B., Patshull Home Farm, Wolverhampton, "Patshull Prince 5th" (E 43).
 2nd No. 1258 Woolland, Walter, Baydon Manor, Ramsbury, Marlborough, "Savernake Don Juan" (E 281).
 3rd No. 1254 M'Caig & Goodchild, Foreside of Cairn, Forfar, "Baydon General 5th" (D 119).
 V No. 1255 Mitchell, G. W., & Son, Foss Farm, Wilberfoss, York, "Orchard Dock 1st" (E 129).
 H No. 1252 Elder, J. S., East Bearford, Haddington, "Bearford Samson" (D 429).
 C No. 1253 Elder, J. S., East Bearford, Haddington, "Bearford Sirdar 2nd."
 C No. 1256 Mitchell, W. Ashby, Balbeuchly Home Farm, Dundee, "Yam Eric 1st" (E 133).

EXTRA STOCK.

The following was awarded the Silver Medal:—

- No. 1257 Woolland, Walter, Baydon Manor, Ramsbury, Marlborough, "Redmarley Perfection" (B247).

CLASS 158. BOAR, born in 1929.—PREMIUMS, £6, £3, and £1.

- 1st No. 1259 Dartmouth, The Earl of, P.C., K.C.B., Patshull Home Farm, Wolverhampton, "Patshull Heroic 2nd" (F 33).
 2nd No. 1265 Woolland, Walter, Baydon Manor, Ramsbury, Marlborough, "Baydon Highlander 5th" (F 15).
 3rd No. 1262 Holms, Miss Constance E. C., Sandyford, Paisley, "Sandyford Sporty 2nd" (F 89).
 V No. 1263 M'Caig & Goodchild, Foreside of Cairn, Forfar, "Yam Baldwin 2nd."
 H No. 1260 Elder, J. S., East Bearford, Haddington, "Bearford Sailor."
 C No. 1264 Mitchell, G. W., & Son, Foss Farm, Wilberfoss, York, "Orchard Laddie" (F 49).

Silver Medal for the best Large Black Sow—given by Large Black Pig Society.

- No. 1285 Woolland, Walter, Baydon Manor, Ramsbury, Marlborough, "Baydon Nightingale 52nd" (E 162).

CLASS 159. SOW, born before 1928.—PREMIUMS, £8, £4, and £2.

- 1st No. 1275 Woolland, Walter, Baydon Manor, Ramsbury, Marlborough, "Savernake Daffodil 2nd" (B 206).
 2nd No. 1273 Mitchell, G. W., & Son, Foss Farm, Wilberfoss, York, "Treveglos Lass 67th" (D 1014).
 3rd No. 1271 M'Caig & Goodchild, Foreside of Cairn, Forfar, "Yam Eliza 17th" (C 3798).
 V No. 1267 Elder, J. S., East Bearford, Haddington, "Bearford Snippy" (C 1976).
 H No. 1268 Elder, J. S., East Bearford, Haddington, "Bearford Snippy 3rd" (C 3536).
 C No. 1266 Dartmouth, The Earl of, P.C., K.C.B., Patshull Home Farm, Wolverhampton, "Patshull Susan 5th" (D 596).

CLASS 160. SOW, born in 1928.—PREMIUMS, £8, £4, and £2.

- 1st No. 1285 Woolland, Walter, Baydon Manor, Ramsbury, Marlborough, " Baydon Nightingale 52nd " (E 162).
 2nd No. 1281 M'Caig & Goodchild, Foreside of Cairn, Forfar, " Yam Erica 1st " (E 212).
 3rd No. 1276 Dartmouth, The Earl of, P.C., K.C.B., Patshull Home Farm, Wolverhampton, " Patshull Bangle 19th " (E 448).
 V No. 1279 Holms, Miss Constance E. C., Sandyford, Paisley, " Sandyford Sunflower 1st " (E 838).
 H No. 1282 M'Caig & Goodchild, Foreside of Cairn, Forfar, " Yam Erica 2nd " (E 214).
 C No. 1280 Holms, Miss Constance E. C., Sandyford, Paisley, " Sandyford Sunflower 2nd " (E 840).

CLASS 161. SOW, born in 1929.—PREMIUMS, £6, £3, and £1.

- 1st No. 1290 Mitchell, G. W., & Son, Foss Farm, Wilberfoss, York, " Orchard Beverley 30th " (F 108).
 2nd No. 1291 Woolland, Walter, Baydon Manor, Ramsbury, Marlborough, " Baydon Duchess 5th " (F 30).
 3rd No. 1287 Holms, Miss Constance E. C., Sandyford, Paisley, " Sandyford Sunflower 8th " (F 166).
 V No. 1286 Dartmouth, The Earl of, P.C., K.C.B., Patshull Home Farm, Wolverhampton, " Patshull Susan 20th " (F 68).

LARGE WHITE ULSTER.

CLASSES 162, 163, 164.

(No Entries).

POULTRY.

First Premium—*One Sovereign.*

Second Premium—*Ten Shillings.*

Where there are four or more entries, a Third Premium—*Five Shillings.*

Champion Challenge Bowl, value £50, *for the best exhibit in the Poultry Classes*—given by the Proprietors of 'The Scottish Poultry News,' Aberdeen.

No. 140 Weir, John, Midtown, New Abbey Road, Dumfries.

CHAMPION MEDALS.

1. *Best Cock, any Variety.*

No. 124 Binnie, William, Garth House, Denny.

2. *Best Hen, any Variety.*

No. 326 Mellor, Miles, Hassocks, Honley, Huddersfield.

3. *Best Cockerel, any Variety.*

No. 140 Weir, John, Midtown, New Abbey Road, Dumfries.

4. *Best Pullet, any Variety.*

No. 191 Meikle, John, Camregan, Girvan.

5. *Best Waterfowl.*

No. 467 Huntly, James, & Son, Hirsell Poultry Farm, Coldstream.

6. *Best Turkey.*

No. 521 Smith, Miss Ina, Upper Kirkton, Barthol Chapel, Oldmeldrum.

CLASS 1. LEGHORN—White—Cock.

1st No. 1 Binnie, William, Garth House, Denny.

2nd No. 3 Weir, James, Brickhouse, New Abbey Road, Dumfries.

CLASS 2. LEGHORN—White—Hen.

1st No. 4 Binnie, William, Garth House, Denny.

2nd No. 6 Weir, James, Brickhouse, New Abbey Road, Dumfries.

V No. 5 Pollock, Alexander, 66 Ochil Street, Tillicoultry.

CLASS 3. LEGHORN—White—Cockerel.

- 1st No. 10 Weir, James, Brickhouse, New Abbey Road, Dumfries.
 2nd No. 7 Binnie, William, Garth House, Denny.
 3rd No. 9 Weir, James, Brickhouse, New Abbey Road, Dumfries.
 V No. 8 Shaw, A. H., Great Ouseburn, Yorkshire.

CLASS 4. LEGHORN—White—Pullet.

- 1st No. 14 Weir, James, Brickhouse, New Abbey Road, Dumfries.
 2nd No. 13 Weir, James, Brickhouse, New Abbey Road, Dumfries.
 3rd No. 11 Binnie, William, Garth House, Denny.

CLASS 5. LEGHORN—Exchequer—Cock or Cockerel.

- 1st No. 17 Reid, A. & A., High Williamshaw, Stewarton (Cock).
 2nd No. 16 Nairn, P. D., Hillcrest, St. Ninians, Stirling (Cock).
 3rd No. 18 Stirling, Thomas, Graystale Farm, Stirling (Cock).

CLASS 6. LEGHORN—Exchequer—Hen or Pullet.

- 2nd No. 20 Nairn, P. D., Hillcrest, St. Ninians, Stirling (Hen).

CLASS 7. LEGHORN—Any other Colour—Cock.

- 1st No. 24 Ross, J. C., Stirling Road, Larbert (Brown).
 2nd No. 21 Kirkwood, Robert Arthur, Camelon Hotel, Falkirk (Brown).
 3rd No. 22 M'Alpine, George H., Mailon, Quarter (Brown).
 V No. 23 Manson, William, Whitehall, Maybole (Brown).

CLASS 8. LEGHORN—Any other Colour—Hen.

- 1st No. 25 Kirkwood, Robert Arthur, Camelon Hotel, Falkirk (Brown).
 2nd No. 30 Rutherford, A., & Son, Parliament Square, Kinross (Black).
 3rd No. 29 Ross, J. C., Stirling Road, Larbert (Black).
 V No. 27 Pollock, Alexander, 66 Ochil Street, Tillicoultry (Black).
 H No. 26 Manson, William, Whitehall, Maybole (Brown).
 C No. 28 Pollock, Alexander, 66 Ochil Street, Tillicoultry (Black).

CLASS 9. LEGHORN—Any other Colour—Cockerel.

(Not forward).

CLASS 10. LEGHORN—Any other Colour—Pullet.

- 1st No. 32 Kirkwood, Robert Arthur, Camelon Hotel, Falkirk (Brown).
 2nd No. 33 Weir, James, Brickhouse, New Abbey Road, Dumfries (Black).

CLASS 11. MINORCA—Cock.

- 1st No. 36 Weir, James, Brickhouse, New Abbey Road, Dumfries.
 2nd No. 35 Binnie, William, Garth House, Denny.
 V No. 34 Binnie, William, Garth House, Denny.

CLASS 12. MINORCA—Hen.

- 1st No. 42 Weir, James, Brickhouse, New Abbey Road, Dumfries.
 2nd No. 39 Binnie, William, Garth House, Denny.
 3rd No. 37 Anderson, James, Kirkhill, Ardrossan.
 V No. 40 Binnie, William, Garth House, Denny.
 H No. 38 Anderson, James, Kirkhill, Ardrossan.
 C No. 41 Sandison, Alfred, Bakery, Echt.

CLASS 13. MINORCA—Cockerel.

- 1st No. 46 Weir, James, Brickhouse, New Abbey Road, Dumfries.
 2nd No. 45 Macgregor, James Scott, High Street, Greenlaw.
 3rd No. 44 Binnie, William, Garth House, Denny.

CLASS 14. MINORCA—Pullet.

- 1st No. 50 Weir, James, Brickhouse, New Abbey Road, Dumfries.
 2nd No. 47 Binnie, William, Garth House, Denny.
 3rd No. 49 Macgregor, James Scott, High Street, Greenlaw.

CLASS 15. HAMBURGH—Cock.

- 1st No. 52 Forsyth, John F., Clackmannan.
 2nd No. 51 Forsyth, John F., Clackmannan.
 V No. 53 Milligan, William, Mid Murray, East Kilbride.

CLASS 16. HAMBURGH—Hen.

- 1st No. 55 Forsyth, John F., Clackmannan.
 2nd No. 57 Forsyth, John F., Clackmannan.
 3rd No. 54 Dow, J., & Son, Deansland, Auchterarder.
 V No. 58 Hilston, James S., Kirk Street, Strathaven.
 H No. 56 Forsyth, John F., Clackmannan.
 C No. 59 Milligan, William, Mid Murray, East Kilbride.

CLASS 17. HAMBURGH—Cockerel.

- 1st No. 60 Forsyth, John F., Clackmannan.

CLASS 18. HAMBURGH—Pullet.

- 1st No. 61 Forsyth, John F., Clackmannan.

CLASS 19. SCOTCH GREY—Cock.

- 1st No. 66 Ramsay, William, Muirhouse, Crosshouse.
 2nd No. 67 Ramsay, William, Muirhouse, Crosshouse.
 3rd No. 68 Stirling, Thomas, Graystale Farm, Stirling.
 V No. 63 Dow, J., & Son, Deansland, Auchterarder.
 H No. 62 Carswell, John, 148 Graham's Road, Falkirk.
 C No. 64 Hearnshaw, R. Fletcher, Foxhill, Burton Joyce, Nottingham.

CLASS 20. SCOTCH GREY—Hen.

- 1st No. 1 Bin-
 2nd No. 3 Weir, James, Eastview, 112 Glasgow Road, Paisley.
 C, Thomas, Graystale Farm, Stirling.
 , William, Muirhouse, Crosshouse.
 1st No. 4 Binnie, J., & Son, Deansland, Auchterarder.
 2nd No. 6 Weir, James, Eastview, 112 Glasgow Road, Paisley.
 V No. 5 Pollock, J.

CLASS 21. SCOTCH GREY—Cockerel.

- 1st No. 80 Carswell, John, 148 Graham's Road, Falkirk.
 2nd No. 81 Carswell, John, 148 Graham's Road, Falkirk.
 3rd No. 83 Ramsay, William, Muirhouse, Crosshouse.
 V No. 82 Ramsay, William, Muirhouse, Crosshouse.
 C No. 79 Brown, J. W., Rosehill, Summerston, Glasgow.

CLASS 22. SCOTCH GREY—Pullet.

- 1st No. 88 Retson, J. M., Mouse Mill, Lanark.
 2nd No. 86 Ramsay, William, Muirhouse, Crosshouse.
 3rd No. 85 Carswell, John, 148 Graham's Road, Falkirk.
 V No. 87 Ramsay, William, Muirhouse, Crosshouse.

CLASS 23. PLYMOUTH ROCK—Barred—Cock.

- 1st No. 89 Reid, David, Firthview, Portgordon.
 2nd No. 90 Smith, James H., Peet's Farm, Southport.
 3rd No. 91 Wilson, Ludovic, Thorn Farm, Dollar.
 V No. 92 Wilson, Ludovic, Thorn Farm, Dollar.

CLASS 24. PLYMOUTH ROCK—Barred—Hen.

- 1st No. 94 Smith, James H., Peet's Farm, Southport.
 2nd No. 93 Reid, David, Firthview, Portgordon.
 V No. 95 Wilson, Ludovic, Thorn Farm, Dollar.

CLASS 25. PLYMOUTH ROCK—Barred—Cockerel.

- 1st No. 96 Wilson, Ludovic, Thorn Farm, Dollar.

CLASS 26. PLYMOUTH ROCK—Barred—Pullet.

- 1st No. 97 Wilson, Ludovic, Thorn Farm, Dollar.

**CLASS 27. PLYMOUTH ROCK—Any other Colour—
Cock or Cockerel.**

- 1st No. 98 Hay, James D., Glenearn, Bridge of Earn (Cock, Buff).

CLASS 28. PLYMOUTH ROCK—Any other Colour—Hen or Pullet.

- 1st No. 99 Hay, James D., Glenearn, Bridge of Earn (Hen, White).

CLASS 29. ORPINGTON—Black—Cock.

- 1st No. 102 Smith, James H., Peet's Farm, Southport.
 2nd No. 100 Reid, David, Firthview, Portgordon.
 3rd No. 101 Rottenburg, F. A., Lochlane, Crieff.
 V No. 103 Thomson, W., Ivy Cottage, Tynninghame, Prestonkirk.

CLASS 30. ORPINGTON—Black—Hen.

- 1st No. 104 Reid, David, Firthview, Portgordon.
 2nd No. 105 Smith, James H., Peet's Farm, Southport.

CLASS 31. ORPINGTON—Any other Colour—Cock.

1st No. 107 Reid, David, Firthview, Portgordon (Buff).

CLASS 32. ORPINGTON—Any other Colour—Hen.

1st No. 108 Reid, David, Firthview, Portgordon (Buff).

2nd No. 109 Reid, David, Firthview, Portgordon (Buff).

CLASS 33. ORPINGTON—Any Colour—Cockerel.

1st No. 110 Reid, David, Firthview, Portgordon (Black).

CLASS 34. ORPINGTON—Any Colour—Pullet.

1st No. 111 Reid, David, Firthview, Portgordon (Black).

CLASS 35. WYANDOTTE—Gold or Silver—Cock.

1st No. 114 Smith, James H., Peet's Farm, Southport (Gold).

2nd No. 113 Morgan, William, Balcurvie, Windygates (Gold).

CLASS 36. WYANDOTTE—Gold or Silver—Hen.

1st No. 116 Smith, James H., Peet's Farm, Southport (Gold).

2nd No. 115 Morgan, William, Balcurvie, Windygates (Silver).

CLASS 37. WYANDOTTE—Gold or Silver—Cockerel.

1st No. 117 Petticrew, James, Springhill, Strone, Argyll (Gold).

2nd No. 118 Phillipson, J. M., Wyandotte Farm, Gilsland, Carlisle (Silver).

CLASS 38. WYANDOTTE—Gold or Silver—Pullet.

1st No. 123 Smith, James H., Peet's Farm, Southport (Gold).

2nd No. 122 Philipson, J. M., Wyandotte Farm, Gilsland, Carlisle (Silver).

3rd No. 120 Morgan, William, Balcurvie, Windygates (Gold).

V No. 121 Petticrew, James, Springhill, Strone, Argyll (Gold).

CLASS 39. WYANDOTTE—White—Cock.

1st No. 124 Binnie, William, Garth House, Denny.

2nd No. 125 Morgan, William, Balcurvie, Windygates.

3rd No. 128 Weir, John, Midtown, New Abbey Road, Dumfries.

V No. 126 Petrie, Alexander, Mayfield, Airth Station, Falkirk.

CLASS 40. WYANDOTTE—White—Hen.

1st No. 135 Weir, John, Midtown, New Abbey Road, Dumfries.

2nd No. 129 Binnie, William, Garth House, Denny.

3rd No. 134 Reid, David, Firthview, Portgordon.

V No. 133 Petrie, Alexander, Mayfield, Airth Station, Falkirk.

CLASS 41. WYANDOTTE—White—Cockerel.

- 1st No. 140 Weir, John, Midtown, New Abbey Road, Dumfries.
 2nd No. 136 Binnie, William, Garth House, Denny.
 3rd No. 139 Weir, John, Midtown, New Abbey Road, Dumfries.

CLASS 42. WYANDOTTE—White—Pullet.

- 1st No. 146 Weir, John, Midtown, New Abbey Road, Dumfries.
 2nd No. 141 Binnie, William, Garth House, Denny.
 3rd No. 147 Weir, John, Midtown, New Abbey Road, Dumfries.
 V No. 144 Peterkin, M. J. Grant, Grange Hall, Forres.

CLASS 43. WYANDOTTE—Partridge—Cock or Cockerel.

- 1st No. 148 Brown, Charles, Ivybank, Kintore (Cock).

CLASS 44. WYANDOTTE—Partridge—Hen or Pullet.

- 1st No. 149 Brown, Charles, Ivybank, Kintore (Hen).

CLASS 45. WYANDOTTE—Columbian—Cock or Cockerel.

- 1st No. 150 Brown, Fred, Woodside, Grimscar, Huddersfield (Cock).
 2nd No. 151 Dickinson, J., & Son, Vale House, Loose, Maidstone,
 Kent (Cockerel).
 3rd No. 152 Parker, Miss M. S., Baldernock, Milngavie (Cock).

CLASS 46. WYANDOTTE—Columbian—Hen or Pullet.

- 1st No. 155 Brown, Fred, Woodside, Grimscar, Huddersfield (Hen).
 2nd No. 160 Shaw, A. H., Great Ouseburn, Yorkshire (Pullet).
 3rd No. 158 Parker, Miss M. S., Baldernock, Milngavie (Hen).
 V No. 156 Dickinson, J., & Son, Vale House, Loose, Maidstone,
 Kent (Pullet).
 H No. 157 Forman, Ronald, Burnhead, Bridge of Cally, Blairgowrie
 (Hen).

CLASS 47. WYANDOTTE—Any other Colour—Cock or Cockerel.

- 1st No. 161 Hay, James D., Glenearn, Bridge of Earn (Cock, Black).

CLASS 48. WYANDOTTE—Any other Colour—Hen or Pullet.

- 1st No. 163 Wilson, Andrew, Jun., Springbank Cottage, Lanark
 (Hen, Black).
 2nd No. 162 Hay, James D., Glenearn, Bridge of Earn (Hen, Black).

CLASS 49. RHODE ISLAND RED—Cock.

- 1st No. 173 Smith, James H., Peet's Farm, Southport.
 2nd No. 171 Reid, David, Firthview, Portgordon.
 3rd No. 169 Morgan, William, Balcurvie, Windygates.
 V No. 164 Brown, Charles, Ivybank, Kintore.
 H No. 172 Robertson, John, Craigend, Dundas Castle, South Queens-
 ferry.
 C No. 165 Carmichael, J. & D., 39 Belstane Road, Carluke.
 C No. 170 Petrie, Alexander, Mayfield, Airth Station, Falkirk.

CLASS 50. RHODE ISLAND RED—Hen.

- 1st No. 179 Robertson, John, Craigend, Dundas Castle, South Queensferry.
 2nd No. 180 Smith, James H., Peet's Farm, Southport.
 3rd No. 178 Reid, David, Firthview, Portgordon.
 V No. 177 Petrie, Alexander, Mayfield, Airth Station, Falkirk.

CLASS 51. RHODE ISLAND RED—Cockerel.

- 1st No. 184 Reid, David, Firthview, Portgordon.
 2nd No. 185 Robertson, John, Craigend, Dundas Castle, South Queensferry.
 3rd No. 186 Smith, James H., Peet's Farm, Southport.
 V No. 183 Petrie, Alexander, Mayfield, Airth Station, Falkirk.

CLASS 52. RHODE ISLAND RED—Pullet.

- 1st No. 191 Meikle, John, Camregan, Girvan.
 2nd No. 197 Smith, James H., Peet's Farm, Southport.
 3rd No. 196 Robertson, John, Craigend, Dundas Castle, South Queensferry.
 V No. 187 Baird, William, 1 Loudoun Street, Mauchline.
 H No. 195 Robertson, John, Craigend, Dundas Castle, South Queensferry.
 C No. 189 Carmichael, J. & D., 39 Belstane Road, Carlisle.
 C No. 193 Petrie, Alexander, Mayfield, Airth Station, Falkirk.
 C No. 198 Wightman, George, Stenton Gates, Prestonkirk.

CLASS 53. SUSSEX—Light—Cock.

- 1st No. 200 Hay, James D., Glenearn, Bridge of Earn.
 2nd No. 201 Wilkie, John, Orr Bridge Poultry Farm, Dysart.
 3rd No. 199 Grant, Mrs M. A., Kirby Hall, Horton Kirby, Kent.
 V No. 203 Younger, W. R., Auchen Castle, Moffat.

CLASS 54. SUSSEX—Light—Hen.

- 1st No. 205 Grant, Mrs M. A., Kirby Hall, Horton Kirby, Kent.
 2nd No. 207 Morgan, William, Balcurvie, Windygates.
 3rd No. 208 Wilkie, John, Orr Bridge Poultry Farm, Dysart.
 V No. 206 Hay, James D., Glenearn, Bridge of Earn.
 H No. 209 Younger, W. R., Auchen Castle, Moffat.

CLASS 55. SUSSEX—Light—Cockerel.

- 1st No. 214 Weir, James, Brickhouse, New Abbey Road, Dumfries.
 2nd No. 215 Wilkie, John, Orr Bridge Poultry Farm, Dysart.
 3rd No. 213 Underwood, Henry, Mowshurst Poultry Farm, Edenbridge, Kent.
 V No. 211 Grant, Mrs M. A., Kirby Hall, Horton Kirby, Kent.
 H No. 216 Wilkie, John, Orr Bridge Poultry Farm, Dysart.
 C No. 217 Younger, W. R., Auchen Castle, Moffat.

CLASS 56. SUSSEX—Light—Pullet.

- 1st No. 220 Meikle, John, Camregan, Girvan.
 2nd No. 221 Shaw, A. H., Great Ouseburn, Yorkshire.
 3rd No. 223 Wilkie, John, Orr Bridge Poultry Farm, Dysart.
 V No. 224 Younger, W. R., Auchen Castle, Moffat.

CLASS 57. SUSSEX—Any other Variety—Cock.

- 1st No. 225 Grant, Mrs M. A., Kirby Hall, Horton Kirby, Kent (Red, Speckled).
 2nd No. 226 Grant, Mrs M. A., Kirby Hall, Horton Kirby, Kent (Red, Speckled).
 3rd No. 227 Smith, James H., Peet's Farm, Southport (Speckled).
 V No. 229 Wilkie, John, Orr Bridge Poultry Farm, Dysart, (Speckled).
 H No. 228 Weir, James, Brickhouse, New Abbey Road, Dumfries (Speckled).

CLASS 58. SUSSEX—Any other Variety—Hen.

- 1st No. 233 Smith, James H., Peet's Farm, Southport (Speckled).
 2nd No. 234 Weir, James, Brickhouse, New Abbey Road, Dumfries (Speckled).
 3rd No. 230 Grant, Mrs M. A., Kirby Hall, Horton Kirby, Kent (Brown).
 V No. 232 Kirkwood, Robert Arthur, Camelon Hotel, Falkirk (Speckled).
 H No. 236 Younger, W. R., Auchen Castle, Moffat (Speckled).
 C No. 231 Grant, Mrs M. A., Kirby Hall, Horton Kirby, Kent (Speckled).
 C No. 235 Wilkie, John, Orr Bridge Poultry Farm, Dysart (Speckled).

CLASS 59. SUSSEX—Any other Variety—Cockerel.

- 1st No. 237 Grant, Mrs M. A., Kirby Hall, Horton Kirby, Kent (Brown).
 2nd No. 238 Grant, Mrs M. A., Kirby Hall, Horton Kirby, Kent (Speckled).

CLASS 60. SUSSEX—Any other Variety—Pullet.

- 1st No. 240 Grant, Mrs M. A., Kirby Hall, Horton Kirby, Kent, (Speckled).
 2nd No. 239 Grant, Mrs M. A., Kirby Hall, Horton Kirby, Kent (Brown).

CLASS 61. DORKING—Coloured—Cock.

- 1st No. 243 Major, A. J., Ditton, Langley, Bucks.
 2nd No. 244 Meikle, John, Camregan, Girvan.
 3rd No. 241 Aitkenhead, Charles, Carr House Farm, New Seaham.

CLASS 62. DORKING—Coloured—Hen.

- 1st No. 248 Rogers, James, Forneth, Blairgowrie.
 2nd No. 247 Meikle, John, Camregan, Girvan.
 3rd No. 246 Major, A. J., Ditton, Langley, Bucks.

CLASS 63. DORKING—Coloured—Cockerel.

- 1st No. 252 Meikle, John, Camregan, Girvan.
 2nd No. 251 Major, A. J., Ditton, Langley, Bucks.

CLASS 64. DORKING—Coloured—Pullet.

- 1st No. 255 Major, A. J., Ditton, Langley, Bucks.
 2nd No. 256 Meikle, John, Camregan, Girvan.

CLASS 65. DORKING—Silver Grey—Cock.

- 1st No. 257 Aitkenhead, Charles, Carr House Farm, New Seaham.
 2nd No. 260 Mechie, John, Upper Greens, Auchtermuchty.
 3rd No. 262 Rogers, James, Forneth, Blairgowrie.
 H No. 258 Macintyre, John, Broombank, Blanefield.

CLASS 66. DORKING—Silver Grey—Hen.

- 1st No. 263 Aitkenhead, Charles, Carr House Farm, New Seaham.
 2nd No. 265 Mechie, John, Upper Greens, Auchtermuchty.
 3rd No. 267 Rogers, James, Forneth, Blairgowrie.

CLASS 67. DORKING—Silver Grey—Cockerel.

- 1st No. 270 Mechie, John, Upper Greens, Auchtermuchty.
 2nd No. 269 Major, A. J., Ditton, Langley, Bucks.
 3rd No. 272 Rogers, James, Forneth, Blairgowrie.
 V No. 268 Bryce, William, Snaigow, Murthly.

CLASS 68. DORKING—Silver Grey—Pullet.

- 1st No. 273 Aitkenhead, Charles, Carr House Farm, New Seaham.
 2nd No. 276 Mechie, John, Upper Greens, Auchtermuchty.
 3rd No. 275 Major, A. J., Ditton, Langley, Bucks.
 V No. 277 Mechie, John, Upper Greens, Auchtermuchty.
 H No. 278 Rogers, James, Forneth, Blairgowrie.
 C No. 274 Fulton, K. G., Knollhead, Kettins, Coupar-Angus.
 C No. 279 Rogers, James, Forneth, Blairgowrie.

CLASS 69. SCOTS DUMPY—Cock.

- 1st No. 280 Kerr, J. E., of Harviestoun, Dollar.
 2nd No. 281 Kerr, J. E., of Harviestoun, Dollar.
 3rd No. 283 Major, A. J., Ditton, Langley, Bucks.
 V No. 282 Kerr, J. E., of Harviestoun, Dollar.

CLASS 70. SCOTS DUMPY—Hen.

- 1st No. 284 Brown, J. W., Rosehill, Summerston, Glasgow.
 2nd No. 287 Kerr, J. E., of Harviestoun, Dollar.
 3rd No. 285 Kerr, J. E., of Harviestoun, Dollar.
 V No. 288 Major, A. J., Ditton, Langley, Bucks.
 H No. 286 Kerr, J. E., of Harviestoun, Dollar.

CLASS 71. SCOTS DUMPY—Cockerel.

- 1st No. 291 Kerr, J. E., of Harviestoun, Dollar.
 2nd No. 290 Kerr, J. E., of Harviestoun, Dollar.
 V No. 289 Brown, J. W., Rosehill, Summerston, Glasgow.

CLASS 72. SCOTS DUMPY—Pullet.

- 1st No. 292 Kerr, J. E., of Harviestoun, Dollar.
 2nd No. 293 Kerr, J. E., of Harviestoun, Dollar.

CLASS 73. BARNEVELDER—Cock.

- 1st No. 295 Binnie, William, Garth House, Denny.
 2nd No. 301 Morgan, William, Balcurvie, Windygates.
 3rd No. 300 Manwaring, Mrs, Knole Paddock, Sevenoaks, Kent.
 V No. 296 Bromley-Wilson, Lady, Nabwood, Windermere.
 H No. 299 Gordon, W. W., Bankhead, Milnathort.
 C No. 297 Ferguson, George, & Son, 44 High Street, Clackmannan.

CLASS 74. BARNEVELDER—Hen.

- 1st No. 307 Manwaring, Mrs, Knole Paddock, Sevenoaks, Kent.
 2nd No. 303 Binnie, William, Garth House, Denny.
 3rd No. 306 Ferguson, George, & Son, 44 High Street, Clackmannan.
 V No. 308 Morgan, William, Balcurvie, Windygates.
 H No. 309 Murray, Mrs D. B., The Shieling, Stirling.
 C No. 304 Bromley-Wilson, Lady, Nabwood, Windermere.

CLASS 75. BARNEVELDER—Cockerel.

- 1st No. 312 Manwaring, Mrs, Knole Paddock, Sevenoaks, Kent.
 2nd No. 311 Bromley-Wilson, Lady, Nabwood, Windermere.
 3rd No. 313 Montrose, The Duchess of, Brodick Castle, Arran.
 V No. 314 Morgan, William, Balcurvie, Windygates.

CLASS 76. BARNEVELDER—Pullet.

- 1st No. 317 Manwaring, Mrs, Knole Paddock, Sevenoaks, Kent.
 2nd No. 319 Morgan, William, Balcurvie, Windygates.
 3rd No. 318 Montrose, The Duchess of, Brodick Castle, Arran.
 V No. 316 Bromley-Wilson, Lady, Nabwood, Windermere.

CLASS 77. INDIAN GAME—Cock.

- 1st No. 320 Hay, James D., Glenearn, Bridge of Earn.
 2nd No. 321 Mellor, Miles, Hassocks, Honley, Huddersfield.
 3rd No. 323 Weir, James, Brickhouse, New Abbey Road, Dumfries.
 V No. 322 Scott, Hugh, 1 Orangefield Place, Greenock.

CLASS 78. INDIAN GAME—Hen.

- 1st No. 326 Mellor, Miles, Hassocks, Honley, Huddersfield.
 2nd No. 324 Hay, James D., Glenearn, Bridge of Earn.
 3rd No. 325 Hay, James D., Glenearn, Bridge of Earn.
 V No. 328 Weir, James, Brickhouse, New Abbey Road, Dumfries.
 H No. 327 Scott, Hugh, 1 Orangefield Place, Greenock.

CLASS 79. INDIAN GAME—Cockerel.

1st No. 329 Black, William A. P., Croftfoot, Old Polmont.

CLASS 80. INDIAN GAME—Pullet.

1st No. 330 Hay, James D., Glenearn, Bridge of Earn.

CLASS 81. OLD ENGLISH GAME—Cock.

1st No. 336 Inglis, George C., M.R.C.V.S., Bedford Place, Alloa.
 2nd No. 337 Mellor, Miles, Hassocks, Honley, Huddersfield.
 3rd No. 338 Reed, William Graham, Low Cote Hill Farm, Carlisle.
 V No. 339 Reed, William Graham, Low Cote Hill Farm, Carlisle.
 H No. 334 Hain, Andrew, Lomond Road, Freuchie, Fife.
 C No. 340 Russell, H. N. & H. T., Newton Holme, Kirkbride, Carlisle.
 C No. 341 Sharp & Co., 72 Fairfield, Lassodie, Dunfermline.

CLASS 82. OLD ENGLISH GAME—Hen.

1st No. 346 Mellor, Miles, Hassocks, Honley, Huddersfield.
 2nd No. 347 Reed, William Graham, Low Cote Hill Farm, Carlisle.
 3rd No. 348 Russell, H. N. & H. T., Newton Holme, Kirkbride, Carlisle.
 V No. 345 Inglis, George C., M.R.C.V.S., Bedford Place, Alloa
 H No. 344 Hutt, John, Denend, Cardenden.
 C No. 349 Slater, A., The Old Vicarage, Lythe, Whitby.

CLASS 83. OLD ENGLISH GAME—Cockerel.

1st No. 351 Inglis, George C., M.R.C.V.S., Bedford Place, Alloa.
 2nd No. 352 Reed, William Graham, Low Cote Hill Farm, Carlisle.
 3rd No. 353 Russell, H. N. & H. T., Newton Holme, Kirkbride, Carlisle.

CLASS 84. OLD ENGLISH GAME—Pullet.

1st No. 356 Inglis, George C., M.R.C.V.S., Bedford Place, Alloa
 2nd No. 357 Reed, William Graham, Low Cote Hill Farm, Carlisle.
 3rd No. 355 Hutt, John, Denend, Cardenden.
 H No. 358 Russell, H. N. & H. T., Newton Holme, Kirkbride, Carlisle.

CLASS 85. BANTAM GAME—Old English—Cock.

1st No. 362 Morgan, William, Balcurvie, Windygates.
 2nd No. 361 Mellor, Miles, Hassocks, Honley, Huddersfield.
 3rd No. 359 Ellwood, Joseph W., Papcastle, Cockermouth.
 V No. 363 Sharp & Co., 72 Fairfield, Lassodie, Dunfermline.
 H No. 360 Hutt, John, Denend, Cardenden.

CLASS 86. BANTAM GAME—Old English—Hen.

1st No. 368 Sharp & Co., 72 Fairfield, Lassodie, Dunfermline.
 2nd No. 365 Hutt, John, Denend, Cardenden.
 3rd No. 367 Morgan, William, Balcurvie, Windygates.
 V No. 366 Mellor, Miles, Hassocks, Honley, Huddersfield.
 H No. 369 Sharp & Co., 72 Fairfield, Lassodie, Dunfermline.

CLASS 87. BANTAM GAME—Modern—Cock.

- 1st No. 374 White, George, County Buildings, Cupar, Fife.
 2nd No. 370 Lindsay, Miss Lizzie Low, Coaltown, Markinch.
 3rd No. 373 Sandison, Alfred, Bakery, Echt.
 V No. 371 Lindsay, Miss Lizzie Low, Coaltown, Markinch.
 H No. 372 Sandison, Alfred, Bakery, Echt.

CLASS 88. BANTAM GAME—Modern—Hen.

- 1st No. 378 Sandison, Alfred, Bakery, Echt.
 2nd No. 376 Lindsay, Miss Lizzie Low, Coaltown, Markinch.
 3rd No. 380 White, George, County Buildings, Cupar, Fife.
 V No. 377 Sandison, Alfred, Bakery, Echt.
 H No. 379 Sandison, Alfred, Bakery, Echt.
 C No. 375 Lindsay, Miss Lizzie Low, Coaltown, Markinch.

CLASS 89. BANTAM—Other than Game—Cock.

- 1st No. 384 Loggie, Allan, Cairnlea, Muirkirk (Rosecomb, Black).
 2nd No. 381 Binnie, William, Garth House, Denny (Wyandotte, White).
 3rd No. 386 Marshall, A., Loganlea, Airth, Falkirk (Indian Game).
 V No. 382 Hay, James D., Glenearn, Bridge of Earn (Sussex, Light).
 H No. 387 Mellor, Miles, Hassocks, Honley, Huddersfield (Indian Game).
 C No. 388 Petrie, Alexander, Mayfield, Airth Station, Falkirk (Rhode Island Red).

CLASS 90. BANTAM—Other than Game—Hen.

- 1st No. 391 Hough-Watson, H., Braystones House, Beckermeth, Cumberland (Pekin, Black).
 2nd No. 392 Marshall, A., Loganlea, Airth, Falkirk (Indian Game).
 3rd No. 390 Hay, James D., Glenearn, Bridge of Earn (Sussex, Light).
 V No. 389 Binnie, William, Garth House, Denny (Wyandotte, White).
 H No. 394 Petrie, Alexander, Mayfield, Airth Station, Falkirk (Rhode Island Red).
 C No. 393 Mellor, Miles, Hassocks, Honley, Huddersfield (Indian Game).

CLASS 91. BANTAM—Any Variety—Cockerel.

- 1st No. 398 Delaney, James, Old Town, Gateside (Game).
 2nd No. 397 Delaney, James, Old Town, Gateside (Game).
 3rd No. 399 Hough-Watson, H., Braystones House, Beckermeth, Cumberland (Wyandotte, White).
 V No. 396 Binnie, William, Garth House, Denny (Wyandotte, White).

CLASS 92. BANTAM—Any Variety—Pullet.

- 1st No. 404 Delaney, James, Old Town, Gateside (Game).
 2nd No. 405 Delaney, James, Old Town, Gateside (Game).
 3rd No. 406 Hough-Watson, H., Braystones House, Beckermeth, Cumberland (Wyandotte, White).

**CLASS 93. ANY OTHER RECOGNISED BREED
OF POULTRY—Cock.**

- 1st No. 410 Kirkwood, Robert Arthur, Camelon Hotel, Falkirk (Brahma, Light).
 2nd No. 417 Smith, James H., Peet's Farm, Southport (Campine).
 3rd No. 409 Hough-Watson, H., Braystones House, Beckermest, Cumberland (Polish).
 V No. 412 M'Vicar, Daniel, Burnside Cottage, Lennoxtown (Poland, Gold).
 H No. 408 Hay, James D., Glenearn, Bridge of Earn (Silkie, White).
 C No. 413 Martin, Mrs David, 14 Castlefield, Cupar, Fife (Brahma, Light).
 C No. 414 Petrie, Alexander, Mayfield, Airth Station, Falkirk (Australorp).
 C No. 415 Sandison, Alfred, Bakery, Echt (Sumatra Game).
 C No. 416 Sandison, Alfred, Bakery, Echt (Modern Game).

**CLASS 94. ANY OTHER RECOGNISED BREED
OF POULTRY—Hen.**

- 1st No. 424 Smith, James H., Peet's Farm, Southport (Campine).
 2nd No. 418 Hough-Watson, H., Braystones House, Beckermest, Cumberland (Polish).
 3rd No. 419 Laidler, James, Eastview, 112 Glasgow Road, Paisley (Langshan, Black).
 V No. 420 M'Vicar, Daniel, Burnside Cottage, Lennoxtown (Poland, Gold).
 H No. 421 Miller, Mrs, The Grange, Muckhart, Dollar (Jersey Giant, Black).
 C No. 422 Sandison, Alfred, Bakery, Echt (Sumatra Game).
 C No. 423 Sandison, Alfred, Bakery, Echt (Modern Game).

**CLASS 95. ANY OTHER RECOGNISED BREED
OF POULTRY—Cockerel.**

(Not forward).

**CLASS 96. ANY OTHER RECOGNISED BREED
OF POULTRY—Pullet.**

- 1st No. 429 Hough-Watson, H., Braystones House, Beckermest, Cumberland (Polish).
 2nd No. 430 Laidler, James, Eastview, 112 Glasgow Road, Paisley (Orloff).
 3rd No. 428 Fulton, K. G., Knollhead, Kettins, Coupar-Angus (Faverolle).
 V No. 431 Sandison, Alfred, Bakery, Echt (Sumatra Game).

CLASS 97. PURE-BRED FOWLS FOR LAYING PURPOSES

—Any Heavy Breed—Hen or Pullet.

- 1st No. 440 Smith, James H., Peet's Farm, Southport (Hen, Rhode Island Red).
 2nd No. 437 Mechie, John, Upper Greens, Auchtermuchty (Hen, Dorking, Silver Grey).
 3rd No. 434 Hay, James D., Glenearn, Bridge of Earn (Hen, Sussex, Light).
 V No. 433 Binnie, William, Garth House, Denny (Hen, Wyandotte, White).
 H No. 435 Huntly, James & Son, Hirsell Poultry Farm, Coldstream (Hen, Wyandotte, White).
 C No. 436 Lethen Estates Poultry Farm, Lethen, Nairn (Hen, Rhode Island Red).
 C No. 439 Peterkin, M. J. Grant, Grange Hall, Forres (Pullet, Wyandotte, White).
 C No. 441 Weir, James, Brickhouse, New Abbey Road, Dumfries (Hen, Sussex, Speckled).
 C No. 442 Younger, W. R., Auchan Castle, Moffat (Hen, Sussex, Light).
 C No. 443 Younger, W. R., Auchan Castle, Moffat (Pullet, Sussex, Light).

CLASS 98. PURE-BRED FOWLS FOR LAYING PURPOSES

—Any Light Breed—Hen or Pullet.

- 1st No. 449 Smith, James H., Peet's Farm, Southport (Hen, Ancona).
 2nd No. 450 Weir, James, Brickhouse, New Abbey Road, Dumfries (Hen, Leghorn, White).
 3rd No. 448 Ramsay, William, Muirhouse, Crosshouse (Hen, Scotch Grey).
 V No. 446 Hay, James D., Glenearn, Bridge of Earn (Hen, Minorca, Black).
 H No. 444 Binnie, William, Garth House, Denny (Hen, Leghorn, White).
 C No. 445 Cuthbertson, Andrew, 12 St. Andrews Road, Peebles (Hen, Leghorn, White).
 C No. 447 Manson, William, Whitehall, Maybole (Hen, Leghorn, Brown).
 C No. 451 Younger, W. R., Auchan Castle, Moffat (Hen, Leghorn, Black).

CLASS 99. CROSS-BRED FOWLS FOR LAYING PURPOSES—Hen.

- 1st No. 452 Binnie, William, Garth House, Denny.
 2nd No. 454 Meikle, John, Camregan, Girvan.
 3rd No. 455 Petrie, Alexander, Mayfield, Airth Station, Falkirk.
 V No. 456 Weir, James, Brickhouse, New Abbey Road, Dumfries.

CLASS 100. CROSS-BRED FOWLS FOR LAYING PURPOSES

—Pullet.

- 1st No. 458 Binnie, William, Garth House, Denny.
 2nd No. 459 Ramsay, William, Muirhouse, Crosshouse.
 V No. 460 Weir, James, Brickhouse, New Abbey Road, Dumfries.

CLASS 101. DUCKS—Aylesbury—Drake.

- 1st No. 463 Huntly, James, & Son, Hirsell Poultry Farm, Coldstream.
 2nd No. 462 Huntly, James, & Son, Hirsell Poultry Farm, Coldstream.
 3rd No. 464 Huntly, James, & Son, Hirsell Poultry Farm, Coldstream.
 H No. 465 Rottenburg, F. A., Lochlane, Crieff.

CLASS 102. DUCKS—Aylesbury—Duck.

- 1st No. 467 Huntly, James, & Son, Hirsell Poultry Farm, Coldstream.
 2nd No. 469 Huntly, James, & Son, Hirsell Poultry Farm, Coldstream.
 3rd No. 468 Huntly, James, & Son, Hirsell Poultry Farm, Coldstream.
 C No. 466 Dalgleish, James P., of Westgrange, Newmills, Dunfermline.

CLASS 103. DUCKS—Aylesbury—Drake (Young).

- 1st No. 473 Huntly, James, & Son, Hirsell Poultry Farm, Coldstream.
 2nd No. 471 Huntly, James, & Son, Hirsell Poultry Farm, Coldstream.
 V No. 472 Huntly, James, & Son, Hirsell Poultry Farm, Coldstream.

CLASS 104. DUCKS—Aylesbury—Duck (Young).

- 1st No. 476 Huntly, James, & Son, Hirsell Poultry Farm, Coldstream.
 2nd No. 475 Huntly, James, & Son, Hirsell Poultry Farm, Coldstream.
 3rd No. 477 Huntly, James, & Son, Hirsell Poultry Farm, Coldstream.
 H No. 474 Burnett, G. J. L., Powis House, Aberdeen.

CLASS 105. DUCKS—Orpington—Drake.

- 1st No. 481 Huntly, James, & Son, Hirsell Poultry Farm, Coldstream.
 2nd No. 480 Huntly, James, & Son, Hirsell Poultry Farm, Coldstream.
 3rd No. 479 Huntly, James, & Son, Hirsell Poultry Farm, Coldstream.
 V No. 482 Kirkwood, Robert Arthur, Camelon Hotel, Falkirk.
 H No. 478 Dalgleish, James P., of Westgrange, Newmills, Dunfermline.

CLASS 106. DUCKS—Orpington—Duck.

- 1st No. 483 Huntly, James, & Son, Hirsell Poultry Farm, Coldstream.
 2nd No. 484 Huntly, James, & Son, Hirsell Poultry Farm, Coldstream.
 V No. 485 Huntly, James, & Son, Hirsell Poultry Farm, Coldstream.

CLASS 107. DUCKS—Orpington—Drake (Young).

- 1st No. 487 Huntly, James, & Son, Hirsell Poultry Farm, Coldstream.
 2nd No. 488 Huntly, James, & Son, Hirsell Poultry Farm, Coldstream.
 V No. 486 Huntly, James, & Son, Hirsell Poultry Farm, Coldstream.

CLASS 108. DUCKS—Orpington—Duck (Young).

- 1st No. 489 Huntly, James, & Son, Hirsell Poultry Farm, Coldstream.
 2nd No. 490 Huntly, James, & Son, Hirsell Poultry Farm, Coldstream.
 V No. 491 Huntly, James, & Son, Hirsell Poultry Farm, Coldstream.

CLASS 109. DUCKS—Indian Runner—Drake.

- 1st No. 500 Weir, James, Brickhouse, New Abbey Road, Dumfries.
 2nd No. 494 Hewetson, Rev. J., Burbage Vicarage, Buxton.
 3rd No. 498 Smith, James H., Peet's Farm, Southport.
 V No. 492 Dalgleish, James P., of Westgrange, Newmills, Dunfermline.
 H No. 499 Weir, James, Brickhouse, New Abbey Road, Dumfries.
 C No. 495 Howie, Robert, Flatterton Farm, Inverkip.
 C No. 496 Kirkwood, Robert Arthur, Camelon Hotel, Falkirk.

CLASS 110. DUCKS—Indian Runner—Duck.

- 1st No. 507 Weir, James, Brickhouse, New Abbey Road, Dumfries.
 2nd No. 505 Kirkwood, Robert Arthur, Camelon Hotel, Falkirk.
 3rd No. 506 Smith, James H., Peet's Farm, Southport.
 V No. 503 Hewetson, Rev. J., Burbage Vicarage, Buxton.
 H No. 501 Dalglish, James P., of Westgrange, Newmills, Dunfermline.
 C No. 502 Dalglish, James P., of Westgrange, Newmills, Dunfermline.

CLASS 111. DUCKS—Any other Variety—Drake.

- 1st No. 510 Kirkwood, Robert Arthur, Camelon Hotel, Falkirk (Rouen).
 2nd No. 508 Hay, James D., Glenearn, Bridge of Earn (Muscovy).
 3rd No. 511 Macpherson, Robert, Drumboy, Darvel (Wild).

CLASS 112. DUCKS—Any other Variety—Duck.

- 1st No. 512 Keir, William, Home Farm, Linplum, Haddington (Rouen).
 2nd No. 513 Kirkwood, Robert Arthur, Camelon Hotel, Falkirk (Rouen).
 V No. 514 Macpherson, Robert, Drumboy, Darvel (Wild).

CLASS 113. GEESE—Gander.

- 1st No. 516 Rottenburg, F. A., Lochlane, Crieff.
 2nd No. 515 Hay, James D., Glenearn, Bridge of Earn.

CLASS 114. GEESE—Goose.

- 1st No. 517 Hay, James D., Glenearn, Bridge of Earn.
 2nd No. 518 Rottenburg, F. A., Lochlane, Crieff.

CLASS 115. TURKEYS—Cock.

- 1st No. 521 Smith, Miss Ina, Upper Kirkton, Barthol Chapel, Old-meldrum.
 2nd No. 520 Rottenburg, F. A., Lochlane, Crieff.
 3rd No. 522 Smith, Miss Ina, Upper Kirkton, Barthol Chapel, Old-meldrum.

CLASS 116. TURKEYS—Hen.

- 1st No. 526 Rottenburg, F. A., Lochlane, Crieff.
 2nd No. 528 Waddell, Andrew, Claret Farm, Grangemouth.
 3rd No. 525 Rottenburg, F. A., Lochlane, Crieff.
 V No. 527 Smith, Miss Ina, Upper Kirkton, Barthol Chapel, Old-meldrum.

TABLE POULTRY.**CLASS 117. TABLE FOWLS—Any Pure Breed—Cockerel.**

- 1st No. 530 Binnie, William, Garth House, Denny (Wyandotte, White).
 2nd No. 533 Mechie, John, Upper Greens, Auchtermuchty (Dorking, Silver Grey).
 3rd No. 536 Wilkie, Joseph, 12 Cross Street, Dysart (Sussex, Light).
 V No. 531 Black, William A. P., Croftfoot, Old Polmont (Sussex).
 H No. 534 Petrie, Alexander, Mayfield, Airth Station, Falkirk (Plymouth Rock, Buff).
 C No. 535 Robertson, John, Craigend, Dundas Castle, South Queensferry (Rhode Island Red)

CLASS 118. TABLE FOWLS—Any Pure Breed
—Pair of Pullets.

- 1st No. 541 Mechie, John, Upper Greens, Auchtermuchty (Dorking, Silver Grey).
 2nd No. 542 Wilkie, Joseph, 12 Cross Street, Dysart (Sussex, Light).
 3rd No. 537 Binnie, William, Garth House, Denny (Wyandotte, White).
 V No. 538 Black, William A. P., Croftfoot, Old Polmont (Sussex).
 H No. 539 Hay, James D., Glenearn, Bridge of Earn (Sussex, Light).

CLASS 119. TABLE FOWLS—Game Cross—Cockerel.

- 1st No. 544 Black, William A. P., Croftfoot, Old Polmont (Indian Game—Sussex).
 2nd No. 546 Penny, James G., Sauchie Poultry Farm, Crieff (Indian Game—Sussex, Light).
 3rd No. 545 Morgan, William, Balcurvie, Windygates (Indian Game—Wyandotte).
 H No. 543 Black, William A. P., Croftfoot, Old Polmont (Indian Game—Sussex).

CLASS 120. TABLE FOWLS—Game Cross—Pair of Pullets.

- 1st No. 548 Black, William A. P., Croftfoot, Old Polmont (Indian Game—Sussex).
 2nd No. 550 Penny, James G., Sauchie Poultry Farm, Crieff (Indian Game—Sussex, Light).
 3rd No. 549 Morgan, William, Balcurvie, Windygates (Indian Game—Wyandotte).

CLASS 121. TABLE FOWLS—Any other Cross—Cockerel.

- 1st No. 554 Wilkie, Joseph, 12 Cross Street, Dysart (Wyandotte—Sussex).
 2nd No. 555 Wilkie, Joseph, 12 Cross Street, Dysart (Wyandotte—Sussex).
 3rd No. 553 Morgan, William, Balcurvie, Windygates (Wyandotte—Sussex).
 H No. 551 Black, William A. P., Croftfoot, Old Polmont (Orpington—Sussex).

CLASS 122. TABLE FOWLS—Any other Cross—Pair of Pullets.

- 1st No. 558 Wilkie, Joseph, 12 Cross Street, Dysart (Sussex—Wyandotte).
 2nd No. 557 Morgan, William, Balcurvie, Windygates (Rhode Island Red—Sussex).
 3rd No. 556 Black, William A. P., Croftfoot, Old Polmont (Orpington—Sussex).

CLASS 123. DUCKLINGS for Table Purposes—Any Breed
or Cross—Pair of Ducklings.

- 1st No. 560 Huntly, James, & Son, Hirsell Poultry Farm, Coldstream.
 2nd No. 561 Huntly, James, & Son, Hirsell Poultry Farm, Coldstream.

FUR-PRODUCING RABBITS.

First Premium—FIFTEEN SHILLINGS. *Second Premium*—TEN SHILLINGS.

Third Premium—FIVE SHILLINGS.

In each Class in which there are less than four entries the Third Prize of Five Shillings will not be awarded.

Champion Silver Medal for best exhibit in the Rabbit Classes.

No. 8 Heywood & Hibbert, Misses, Mears Ghyll Rabbitries, Caton, Lancaster.

CLASS 1. BLUE BEVEREN—Buck.

1st No. 5 Moon, Miss Annie, Edenfield, Springfield, Fife.
2nd No. 2 Duthie, Alexander, 19 Derby Street, Dundee.
3rd No. 4 Macqueen, Miss E., Lauder.

CLASS 2. BLUE BEVEREN—Doe.

1st No. 8 Heywood & Hibbert, Misses, Mears Ghyll Rabbitries, Caton, Lancaster.
2nd No. 7 Duthie, Alexander, 19 Derby Street, Dundee.

CLASS 3. BLUE BEVEREN—Buck or Doe, under 5 months at first day of Show.

1st No. 12 M'Kelvie, Gavin D., Roselea, 31 Bowling Green Street, Methil.
2nd No. 13 Moon, Miss Annie, Edenfield, Springfield, Fife.
3rd No. 14 Moon, Miss Annie, Edenfield, Springfield, Fife.
V No. 11 M'Kelvie, Gavin D., Roselea, 31 Bowling Green Street, Methil.
H No. 10 Graham, Mrs E. Balfour, Levenbank, Leven.

CLASS 4. CHINCHILLA—Buck.

1st No. 20 M'William, P. A., 43 Craiglea Drive, Edinburgh.
2nd No. 26 Peter, Andrew, 178 West High Street, Buckhaven.
3rd No. 22 Moon, Miss Annie, Edenfield, Springfield, Fife.
V No. 17 Fisher, J., Junr., Jellyholm, Alloa.
H No. 18 Forrest, George, 109 Quarry Street, Hamilton.
C No. 25 Paterson, Colin W., 22 Chalmers Road, Ayr.

CLASS 5. CHINCHILLA—Doe.

1st No. 34 M'William, P. A., 43 Craiglea Drive, Edinburgh.
2nd No. 37 Paterson, Colin W., 22 Chalmers Road, Ayr.
3rd No. 32 Forrest, George, 109 Quarry Street, Hamilton.
V No. 36 Mathison, James, Cardsknolls, Kingskettle.
H No. 35 M'William, P. A., 43 Craiglea Drive, Edinburgh.
C No. 31 Aird, Miss E., 10 Somerset Road, Ayr.

CLASS 6. CHINCHILLA—Buck or Doe, under
5 months at first day of Show.

- 1st No. 50 Falconer, John, Mossblown, Annbank Station, Ayr.
 2nd No. 53 M'William, P. A., 43 Craiglea Drive, Edinburgh.
 3rd No. 51 Forrest, George, 109 Quarry Street, Hamilton.
 V No. 54 M'William, P. A., 43 Craiglea Drive, Edinburgh.
 H No. 60 Peter, Andrew, 178 West High Street, Buckhaven.
 C No. 58 Paterson, Colin W., 22 Chalmers Road, Ayr.
 C No. 59 Paterson, Colin W., 22 Chalmers Road, Ayr.

CLASS 7. HAVANA—Buck or Doe.

- 1st No. 65 Aberdeen and Temair, The Marchioness of, House of Cromar,
Tarland (Doe).
 2nd No. 66 Nicolson, Arthur B., Glenbervie House, Drumlithie (Buck).
 3rd No. 69 Wood, John, Moor Hall, Madeley, Crewe (Doe).
 V No. 67 Thomson, Thomas B. L., Ardmore, Barrhead (Buck).
 H No. 64 Aberdeen and Temair, The Marchioness of, House of Cromar,
Tarland (Buck).
 C No. 68 Thomson, Thomas B. L., Ardmore, Barrhead (Doe).

CLASS 8. LILAC—Buck or Doe.

- 1st No. 71 Haynes & Warrington, 37 Westfield Road, Burton-on-
Trent (Buck).
 2nd No. 74 Wood, John, Moor Hall, Madeley, Crewe (Doe).
 3rd No. 70 Ballard, Mrs L. B., 56 St. Catherine's Road, Winchester
(Buck).
 V No. 73 Nicolson, Arthur B., Glenbervie House, Drumlithie (Buck).
 H No. 72 Nicolson, Arthur B., Glenbervie House, Drumlithie (Buck).

CLASS 9. ANGORA—Buck or Doe.

- 1st No. 76 Graham, Mrs E. Balfour, Levenbank, Leven (Buck).
 2nd No. 75 Beattie, John G., Afton Villa, New Cumnock (Doe).
 3rd No. 78 Scoales, Alexander, Gowanlea, Auchterarder (Buck).

CLASS 10. Any other Variety of FUR-PRODUCING RABBIT
—Buck or Doe.

- 1st No. 86 Graham, Mrs E. Balfour, Levenbank, Leven (Marten Sable
Buck).
 2nd No. 94 Nicolson, Arthur B., Glenbervie House, Drumlithie (Chin-
chilla Rex Buck).
 3rd No. 87 M'William, P. A., 43 Craiglea Drive, Edinburgh (Smoke
Beige Doe).
 V No. 99 Pringle, J. S., East Farm, Killingworth (Argente de Cham-
pagne Buck).
 H No. 95 Nicolson, Arthur B., Glenbervie House, Drumlithie (Castor
Rex Doe).
 C No. 88 M'William, P. A., 43 Craiglea Drive, Edinburgh (Marten
Sable Buck).
 C No. 89 Mathison, James, Cardsknolls, Kingskettle (Blue and Tan
Buck).
 C No. 93 Nicolson, Arthur B., Glenbervie House, Drumlithie (Chin-
chilla Rex Buck).

HONEY, &c.

Should there be in any Class three or less than three entries, the value of the first prize will be reduced to that of the second, the second to that of the third, and no third prize will be awarded.

OPEN CLASSES.

Silver and Bronze Medals will be awarded by the Scottish Bee-Keepers' Association to the *First and Second winners of the greatest number of points in Classes 4 to 21, calculated on the following basis: 1st prize, 3 points; 2nd prize, 2 points; 3rd prize, 1 point.*

Silver Medal—Brown, Thomas C., Helenslea, St. Ninians (24 points).

Bronze Medal—Scott, George, Waterton, Old Cumnock (13 points).

Championship Cup, value £5, 5s. This Cup has been gifted by the Rev. John Beveridge, M.B.E., B.D., Gartmore.

Brown, Thomas C., Helenslea, St. Ninians (24 points).

CLASS 1. Collection of APPLIANCES suitable for a beginner's outfit for Bee-keeping. A card naming all the articles, along with the price at which they will be supplied for one year from date, to be fixed to the exhibit.—PREMIUMS, 20s., 15s., 10s.

1st No. 3 Steele, R., & Brodie, Bee Appliance Works, Wormit.
2nd No. 2 Lee, Robert, Fens Road, Perth.

CLASS 2. Best and most complete FRAME HIVE for general use, with any improvements. Unpainted.—PREMIUMS, 20s., 15s., 10s.

1st No. 7 Ogilvie, J. & A., 369 Union Street, Aberdeen.
2nd No. 8 Steele, R., & Brodie, Bee Appliance Works, Wormit.
3rd No. 4 Burtt & Son, Stroud Road, Gloucester.
V No. 6 Lee, Robert, Fens Road, Perth.
H No. 5 Kilgour, J. D., 88 St. Leonard's Street, Dunfermline.

CLASS 3. Best and most complete HIVE. Unpainted. Price not to exceed 35s.—PREMIUMS, 20s., 15s., 10s.

1st No. 11 Steele, R., & Brodie, Bee Appliance Works, Wormit.
2nd No. 9 Burtt & Son, Stroud Road, Gloucester.
V No. 10 Lee, Robert, Fens Road, Perth.

CLASS 4. Six Sections of COMB HONEY, excluding Heather Honey.
—PREMIUMS, 20s., 15s., 10s.

- 1st No. 12 Allan, George C., 7 Springvale Road, Ayr.
 2nd No. 23 Scott, George, Waterton, Old Cumnock.
 3rd No. 24 Thoms, John, Rosslyn Cottage, Coupar-Angus.
 V No. 14 Brown, Thomas C., Helenslea, St. Ninians.
 H No. 22 Jack, John, Bankend Cottage, Airth.
 C No. 13 Blair, Mrs C., Hoprig Mains, Longniddry.
 C No. 19 Fife Bee Garden, Limited, Dura Den, Cupar, Fife.
 C No. 25 Young, Alexander, The Lodge, Bannockburn House,
 Bannockburn.

CLASS 5. Six, Sections of HEATHER HONEY.
—PREMIUMS, 20s. 15s., 10s.

- 1st No. 28 Scott, George, Waterton, Old Cumnock.
 2nd No. 29 Young, Alexander, The Lodge, Bannockburn House,
 Bannockburn.

CLASS 6. Six Jars of RUN or EXTRACTED LIGHT-COLOURED HONEY, approximate weight 6 lb.—PREMIUMS, 20s., 15s., 10s.

- 1st No. 31 Brown, Thomas C., Helenslea, St. Ninians.
 2nd No. 36 Young, Alexander, The Lodge, Bannockburn House,
 Bannockburn.
 3rd No. 30 Allan, George C., Springvale Road, Ayr.
 V No. 35 Scott, George, Waterton, Old Cumnock.
 H No. 33 Fernie, William, Westfield Avenue, Cupar, Fife.
 C No. 34 Hutton, Agnes M., Bee Grove, Milton, Markinch.

CLASS 7. Six Jars of RUN or EXTRACTED MEDIUM or DARK-COLOURED HONEY, excluding Heather Honey, approximate weight 6 lb.—PREMIUMS, 20s., 15s., 10s.

- 1st No. 47 Young, Alexander, The Lodge, Bannockburn House,
 Bannockburn.
 2nd No. 38 Brown, Thomas C., Helenslea, St. Ninians.
 3rd No. 44 Rattray, Alexander, 14 Kirkgate, Cupar, Fife.
 V No. 45 Scott, George, Waterton, Old Cumnock.
 H No. 40 Fife Bee Garden, Limited, Dura Den, Cupar, Fife.
 C No. 39 Fernie, William, Westfield Avenue, Cupar, Fife.
 C No. 41 Hutton, Agnes M., Bee Grove, Milton, Markinch.

CLASS 8. Six Jars of PRESSED HEATHER HONEY in liquid form, approximate weight 6 lb.—PREMIUMS, 20s., 15s., 10s.

- 1st No. 22 Scott, George, Waterton, Old Cumnock.
 C No. 88 M^W₁ Alexander, The Lodge, Bannockburn House,
 Bannockburn.
 C No. 89 Mathiso, W., 7 Glebe Cottages, Mauchline.
 Buchar, Hopefield, Milnathort.
 C No. 93 Nicolson, Thomas C., Helenslea, St. Ninians.
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CLASS 9. Six Jars of GRANULATED HONEY, approximate weight 6 lb.—PREMIUMS, 20s., 15s., 10s.

- 1st No. 57 Pate, Thomas, Hopefield, Milnathort.
- 2nd No. 60 Young, Alexander, The Lodge, Bannockburn House, Bannockburn.
- 3rd No. 59 Thoms, John, Rosslyn Cottage, Coupar-Angus.
- V No. 55 Allan, George C., 7 Springvale Road, Ayr.
- H No. 58 Scott, George, Waterton, Old Cumnock.
- C No. 56 Brown, Thomas C., Helenslea, St. Ninians.

CLASS 10. Two Shallow Frames of COMB HONEY for extracting purposes.—PREMIUMS, 20s., 15s., 10s.

- 1st No. 72 Thoms, John, Rosslyn Cottage, Coupar-Angus.
- 2nd No. 68 Rattray, Alexander, 14 Kirkgate, Cupar, Fife.
- 3rd No. 64 Fife Bee Garden, Limited, Dura Den, Cupar, Fife.
- V No. 63 Fernie, William, Westfield Avenue, Cupar, Fife.

CLASS 11. PRODUCTS made with the aid of Honey.
—PREMIUMS, 20s., 15s., 10s.

- 1st No. 75 Brown, Thomas C., Helenslea, St. Ninians.
- 2nd No. 77 Jackson, H., Neville House, Millfield Terrace, Hexham.
- 3rd No. 79 Wilson, Miss Margaret, St. Margarets, Tillicoultry.
- V No. 80 Wilson, Miss Margaret, St. Margarets, Tillicoultry.
- H No. 76 Fife Bee Garden, Limited, Dura Den, Cupar, Fife.

CLASS 12. Best display of HONEY in any form suitable for a shop window in space 4 feet by 4 feet. Weight of Honey not to exceed 40 lb.—PREMIUMS, 60s., 30s., 20s.

- 1st No. 81 Brown, Thomas C., Helenslea, St. Ninians.
- 2nd No. 83 Pate, Thomas, Hopefield, Milnathort.
- V No. 82 Fife Bee Garden, Limited, Dura Den, Cupar, Fife.

CLASS 13. Best exhibit of not less than 1 lb. of WAX in any form.
—PREMIUMS, 20s., 15s., 10s.

- 1st No. 85 Brown, Thomas C., Helenslea, St. Ninians.
- 2nd No. 92 Todd, James, 68 Turrisdale Street, Crosshill, Glasgow.
- 3rd No. 89 Hutton, Agnes M., Bee Grove, Milton, Markinch.
- V No. 93 Young, Alexander, The Lodge, Bannockburn House, Bannockburn.
- H No. 90 Rattray, Alexander, 14 Kirkgate, Cupar, Fife.
- C No. 88 Greig, Henry, c/o Ashton, 27 Mearns Street, Greenock.
- C No. 91 Smith, William W., Sunnybrae Lodge, Walkerburn.

CLASS 14. Best exhibit of not less than 1 lb. of WAX made into shapes for retail trade and over-counter trade. Convenience in packing to be taken into consideration.—PREMIUMS, 20s., 15s., 10s.

- 1st No. 98 Hutton, Agnes M., Bee Grove, Milton, Markinch.
- 2nd No. 96 Fernie, William, Westfield Avenue, Cupar, Fife.
- 3rd No. 95 Brown, Thomas C., Helenslea, St. Ninians.
- V No. 97 Greig, Henry, c/o Ashton, 27 Mearns Street, Greenock.
- H No. 99 Rattray, Alexander, 14 Kirkgate, Cupar, Fife.
- C No. 94 Allan, George C., 7 Springvale Road, Ayr.
- C No. 100 Todd, James, 65 Turrisdale Street, Crosshill, Glasgow.

CLASS 15. OBSERVATORY HIVE, with Queen and Bees—two or more frames.—PREMIUMS, 50s., 30s., 20s.

- 1st No. 103 Kilgour, J. D., 88 St. Leonard's Street, Dunfermline.
 2nd No. 102 Hutton, W. A., 44 Whirlbut Crescent, Dunfermline.
 3rd No. 101 Erown, Thomas C., Helenslea, St. Ninians.

CLASS 16. OBSERVATORY HIVE with Queen and Bees—one frame, no super.—PREMIUMS, 40s., 30s., 15s.

- 1st No. 105 Fife Bee Garden, Limited, Dura Den, Cupar, Fife.

CONFINED TO SCOTTISH EXHIBITORS.

CLASS 17. One Standard Frame of COMB HONEY for extracting purposes.—PREMIUMS, 20s., 15s., 10s.

- 1st No. 107 Brown, Thomas C., Helenslea, St. Ninians.
 2nd No. 109 Fife Bee Garden, Limited, Dura Den, Cupar, Fife.

CLASS 18. Six Sections of COMB HONEY, excluding Heather Honey.—PREMIUMS, 20s., 15s., 10s.

- 1st No. 114 Brown, Thomas C., Helenslea, St. Ninians.
 2nd No. 124 Scott, George, Waterton, Old Cumnock.
 3rd No. 117 Fife Bee Garden, Limited, Dura Den, Cupar, Fife.
 V No. 113 Allan, George C., 7 Springvale Road, Ayr.
 H No. 120 Jack, John, Bankhead Cottage, Airth.
 C No. 125 Thoms, John, Rosslyn Cottage, Coupar-Angus.
 C No. 127 Young, Alexander, The Lodge, Bannockburn House, Bannockburn.

CLASS 19. Six Sections of HEATHER HONEY.—PREMIUMS, 30s., 20s., 10s.

- 1st No. 130 Scott, George, Waterton, Old Cumnock.
 2nd No. 129 Pate, Thomas, Hopefield, Milnathort.
 3rd No. 131 Smith, William W., Sunnybrae Lodge, Walkerburn.

CLASS 20. Six Jars of RUN or EXTRACTED MEDIUM or DARK-COLOURED HONEY, excluding Heather Honey, approximate weight 6 lb.—PREMIUMS, 30s., 20s., 10s.

- 1st No. 134 Cunningham, Mrs Alexander, Cragston, Stewarton.
 2nd No. 143 Wilson, Miss Margaret, St. Margarets, Tillicoultry.
 3rd No. 132 Allan, George C., 7 Springvale Road, Ayr.
 V No. 141 Scott, George, Waterton, Old Cumnock.
 H No. 139 Pate, Thomas, Hopefield, Milnathort.
 C No. 136 Fife Bee Garden, Limited, Dura Den, Cupar, Fife.
 C No. 137 Hutton, Agnes M., Bee Grove, Milton, Markinch.
 C No. 140 Rattray, Alexander, 14 Kirkgate, Cupar, Fife.

CLASS 21. Six Jars of RUN or EXTRACTED LIGHT-COLOURED HONEY, approximate weight 6 lb.—PREMIUMS, 30s., 20s., 10s.

- 1st No. 144 Allan, George C., 7 Springvale Road, Ayr.
 2nd No. 145 Brown, Thomas C., Helenslea, St. Ninians.
 3rd No. 148 Pate, Thomas, Hopefield, Milnathort.
 V No. 150 Scott, George, Waterton, Old Cumnock.
 H No. 146 Hutton, Agnes M., Bee Grove, Milton, Markinch.

DAIRY PRODUCE.**CLASS 1. POWDERED BUTTER, not less than 3 lb.**
—PREMIUMS, £4, £2, and £1.

- 1st No. 5 Rennie, Miss Isabella M. H., Parkhead, Slamannan.
 2nd No. 3 Monteith, Mrs Helen, The Island, Bothkennar, Falkirk.
 3rd No. 6 Shanks, Miss M., Broomhill, Denny.
 V No. 7 Smith, William, Lorn, Balloch.

CLASS 2. FRESH BUTTER, Three 1-lb. Rolls.
—PREMIUMS, £4, £2, and £1.

- 1st No. 13 Rennie, Miss Isabella M. H., Parkhead, Slamannan.
 2nd No. 11 Monteith, Mrs Helen, The Island, Bothkennar, Falkirk.
 3rd No. 9 Braes, William, Champany Farm, Linlithgow.
 V No. 15 Shanks, Miss M., Broomhill, Denny.

CLASS 3. CHEDDAR CHEESE, 56 lb. and upwards.
—PREMIUMS, £9, £5, £3, £2, and £1.

- 1st No. 26 M'Dowall, George, South Boreland, Dunragit.
 2nd No. 27 M'Minn, Samuel, Torrs Dairy, Kirkcudbright.
 3rd No. 32 Smith, John, Upper Torrs, Castle Douglas.
 4th No. 30 Sheddan, William, Balgerran, Castle Douglas.
 5th No. 25 Little, Peter, Cumstoun Mains Dairy, Twynholm.
 V No. 22 Gibson, John, Dryburgh Dairy, Castle Douglas.

CLASS 4. CHEESE, 14 lb. and under.—PREMIUMS, £5, £3, £2, and £1.

- 1st No. 42 M'Minn, Samuel, Torrs Dairy, Kirkcudbright.
 2nd No. 41 M'Dowall, George, South Boreland, Dunragit.
 3rd No. 35 Cruickshanks, William, Kirkeoch, Kirkcudbright.
 4th No. 47 Smith, David, Hartburn Dairy, Kirkcudbright.
 V No. 36 Dean, William, Cairniehill, Borgue, Kirkcudbright.

WOOL.**PURE BREED CLASSES.****CLASS 1. BLACKFACE WOOL—EWE. Three Fleeces.**
—PREMIUMS, £3, £2, and £1.

- 1st No. 5 Novar Estates, Limited, Novar, Evanton, Ross-shire.
- 2nd No. 8 Thompson, William, Elibank, Walkerburn.
- 3rd No. 9 Thompson, William, Elibank, Walkerburn.
- H No. 10 Thompson, William, Elibank, Walkerburn.

CLASS 2. BLACKFACE WOOL—HOGG. Three Fleeces.
—PREMIUMS, £3, £2, and £1.

- 1st No. 13 Novar Estates, Limited, Novar, Evanton, Ross-shire.
- 2nd No. 17 Thompson, William, Elibank, Walkerburn.
- 3rd No. 19 Thompson, William, Elibank, Walkerburn.
- H No. 18 Thompson, William, Elibank, Walkerburn.

CLASS 3. CHEVIOT WOOL—EWE. Three Fleeces.
—PREMIUMS, £3, £2, and £1.

- 1st No. 25 Thompson, William, Elibank, Walkerburn.
- 2nd No. 24 Elliot, Robert T., Chatto, Jedburgh.
- 3rd No. 23 Elgin and Kincardine, The Earl of, C.M.G., Broomhall, Dunfermline.
- H No. 20 Anderson, Sir Kenneth S., Bart., K.C.M.G., The Yair, Galashiels.

CLASS 4. CHEVIOT WOOL—HOGG. Three Fleeces.
—PREMIUMS, £3, £2, and £1.

- 1st No. 30 Thompson, William, Elibank, Walkerburn.
- 2nd No. 29 Elliot, Robert T., Chatto, Jedburgh.
- 3rd No. 26 Anderson, Sir Kenneth S., Bart., K.C.M.G., The Yair, Galashiels.

CLASS 5. BORDER LEICESTER WOOL—EWE.
Three Fleeces.—PREMIUMS, £3, £2, and £1.

- 1st No. 32 Templeton, T. & M., Sandyknowe, Kelso.
- 2nd No. 33 Templeton, T. & M., Sandyknowe, Kelso.
- 3rd No. 31 Stewart, John, Woodburne, Ceres, Cupar, Fife.

CLASS 6. BORDER LEICESTER WOOL—HOGG. Three Fleeces.
—PREMIUMS, £3, £2, and £1.

- 1st No. 35 Templeton, T. & M., Sandyknowe, Kelso.
- 2nd No. 36 Templeton, T. & M., Sandyknowe, Kelso.
- 3rd No. 34 Stewart, John, Woodburne, Ceres, Cupar, Fife.

CLASS 7. HALF-BRED WOOL—EWE. Three Fleeces.
—PREMIUMS, £3, £2, and £1.

- 1st No. 38 Brown, John C., Hundalee, Jedburgh.
- 2nd No. 37 Brown, John C., Hundalee, Jedburgh.
- 3rd No. 40 Templeton, T. & M., Sandyknowe, Kelso.

CLASS 8. HALF-BRED WOOL—HOGG. Three Fleeces.
—PREMIUMS, £3, £2, and £1.

- 1st No. 41 Brown, John C., Hundalee, Jedburgh.
2nd No. 42 Brown, John C., Hundalee, Jedburgh.
3rd No. 43 Templeton, T. & M., Sandyknowe, Kelso.

CLASS 9. OXFORD-DOWN WOOL—EWE. Three Fleeces.
—PREMIUMS, £3, £2, and £1.

- 1st No. 46 Malcolm, William M., Softlaw, Kelso.
2nd No. 48 Templeton, T. & M., Sandyknowe, Kelso.
3rd No. 44 Harrison, John & R., Gainford Hall, Gainford, Co. Durham.
H No. 45 Harrison, John & R., Gainford Hall, Gainford, Co. Durham.

CLASS 10. OXFORD-DOWN WOOL—HOGG. Three Fleeces.
—PREMIUMS, £3, £2, and £1.

- 1st No. 51 Malcolm, William M., Softlaw, Kelso.
2nd No. 53 Templeton, T. & M., Sandyknowe, Kelso.
3rd No. 50 Harrison, John & R., Gainford Hall, Gainford, Co. Durham.
H No. 49 Harrison, John & R., Gainford Hall, Gainford, Co. Durham.

CLASS 11. SUFFOLK WOOL—EWE. Three Fleeces.
—PREMIUMS, £3, £2, and £1.

- 1st No. 54 Duncan, Commander J. A., Parkhill, Arbroath.
2nd No. 55 Riddell, D., Peaston, Ormiston, East Lothian.
3rd No. 57 Taylor, J. P. Ross, Mungoswalls, Duns.

CLASS 12. SUFFOLK WOOL—HOGG. Three Fleeces.
—PREMIUMS, £3, £2, and £1.

- 1st No. 62 Taylor, J. P. Ross, Mungoswalls, Duns.
2nd No. 61 Taylor, J. P. Ross, Mungoswalls, Duns.
3rd No. 60 Riddell, D., Peaston, Ormiston, East Lothian.
H No. 59 Duncan, Commander J. A., Parkhill, Arbroath.

CLASS 13. DORSET HORN WOOL—EWE. Three Fleeces.
—PREMIUMS, £3, £2, and £1.

- 1st No. 64 Elgin and Kincardine, The Earl of, C.M.G., Broomhall,
Dunfermline.
2nd No. 63 Elgin and Kincardine, The Earl of, C.M.G., Broomhall,
Dunfermline.

CLASS 14. DORSET HORN WOOL—HOGG. Three Fleeces.
—PREMIUMS, £3, £2, and £1.

- 1st No. 65 Elgin and Kincardine, The Earl of, C.M.G., Broomhall,
Dunfermline.
2nd No. 66 Elgin and Kincardine, The Earl of, C.M.G., Broomhall,
Dunfermline.

CLASS 15. SHETLAND WOOL—EWE. Three Fleeces.
—PREMIUMS, £3, £2, and £1.

- 1st No. 69 Campbell, Mrs M. E., Dolphinton House, Dolphinton.
2nd No. 67 Campbell, Mrs M. E., Dolphinton House, Dolphinton.
3rd No. 68 Campbell, Mrs M. E., Dolphinton House, Dolphinton.
H No. 72 White, Thomas Mountford A., Belmont, Uyeasound,
Shetland.

CLASS 16. SHETLAND WOOL—HOGG. Three Fleeces.
—PREMIUMS, £3, £2, and £1.

- 1st No. 74 Campbell, Mrs M. E., Dolphinton House, Dolphinton.
2nd No. 76 Campbell, Mrs M. E., Dolphinton House, Dolphinton.
3rd No. 73 Brown, A. W., Basta, Mid Yell, Shetland.
H No. 75 Campbell, Mrs M. E., Dolphinton House, Dolphinton.

RURAL INDUSTRIES SECTION.

OPEN CLASSES.

SHETLAND KNITTING.

(Exhibits to be made from Shetland Wool).

CLASS 1. FINE LACE GOODS.—PREMIUMS, £3, £2, and £1.

- 1st No. 10 Spence, Miss A., Westside, Uyeasound, Shetland (Scarf).
 2nd No. 1 Clark, Mrs W., Newgord, Uyeasound, Lerwick (Scarf).
 3rd No. 6 Mackay, Miss G. P., Sunnyside, Whiteness, Lerwick (Shawl).
 V No. 2 Clark, Mrs W., Newgord, Uyeasound, Lerwick (Scarf).
 C No. 4 Jamieson, Miss H. S., Gerriegarth, Baltasound, Lerwick (Scarf).

CLASS 2. JUMPER, SPORTS COAT, CARDIGAN, or WAISTCOAT —one or more Colours.—PREMIUMS, £3, £2, and £1.

- 1st No. 23 Laurenson, Miss G. B., Maywick, Bigton, Shetland (Jumper).
 2nd No. 13 Colvin, Miss I. C. J., Ponston, Levenwick, Lerwick (Cardigan).
 3rd No. 15 Dalziel, Miss A., Tait's Buildings, Commercial Road, Lerwick (Jumper Suit).
 V No. 20 Henderson, Miss M. G., North Levenwick, Lerwick (Cardigan).
 C No. 18 Henderson, Miss A., North Levenwick, Lerwick (Jumper).

CLASS 3. JUMPER, SPORTS COAT, CARDIGAN, or WAISTCOAT —all over Fair Isle.—PREMIUMS, £3, £2, and £1.

- 1st No. 44 Jarmson, Miss J., Lochend House, Lerwick (Jumper).
 2nd No. 43 Jamieson, Miss M., Hubie, Fetlar, Shetland (Jumper).
 3rd No. 48 Nicholson, Mrs R. M., Burravoe, South Yell, Shetland (Jumper).
 V No. 38 Gardner, Miss J., Houll, Fetlar, Shetland, (Jumper).
 H No. 36 Farquhar, Mrs E., 9 Hangcliff Lane, Lerwick (Jumper).
 C No. 32 Anderson, Miss J. C., Easter Leigh, Burravoe, Lerwick (Jumper).
 C No. 41 Henderson, Miss A., North Levenwick, Lerwick (Waistcoat).

CLASS 4. OTHER EXHIBITS.—PREMIUMS, £2, £1, and 10s.

- 1st No. 63 Brown, Miss M. J., Kingland, Ollaberry, Shetland (Shawl).
 2nd No. 73 Sandison, Miss J., Orbister, Hamar, Lerwick (Shawl).
 3rd No. 65 Brown, Miss M. J., Kingland, Ollaberry, Shetland (Set of Underwear).
 V No. 62 Brown, Mrs G., Collafirth, Ollaberry, Shetland (Combinations).
 H No. 60 Brown, Mrs G., Collafirth, Ollaberry, Shetland (Shawl).
 C No. 59 Best, Miss L., 3 Green Road, Paisley (Gent's Socks).
 C No. 64 Brown, Miss M. J., Kingland, Ollaberry, Shetland (Bed Jacket).

TWEEDS.**CLASS 5. HARRIS or OTHER TWEED—Hand-spun, Hand-woven, and Vegetable-dyed.—PREMIUMS, £3, £2, and £1.**

- 1st No. 81 M'Leod, Mrs, 20 Portnalong, Carboist, Skye.
 2nd No. 78 M'Innes, Mrs D., 5 Portnalong, Carboist, Skye.
 3rd No. 79 Mackay, Miss R., 9 Portnalong, Carboist, Skye.
 V No. 76 Macdonald, Mrs M., 6 Portnalong, Carboist, Skye.
 H No. 83 Morrison, Mrs D., 7 Portnalong, Carboist, Skye.
 C No. 80 Mackinnon, Mrs, 16 Portnalong, Carboist, Skye.

CLASS 6. TWEED—Mill-spun, Hand-woven.—PREMIUMS, £3, £2, and £1.

- 1st No. 91 Hogg, D., 10 High Street, Earlstoun, Berwickshire.
 2nd No. 95 MacGregor, R., 10 Paton Street, Inverness.
 3rd No. 86 Bangour Hospital, Bangour, West Lothian.
 V No. 93 Macdonald, Miss M., Rheanbreck, Lairg.
 H No. 94 Macdonald, Miss M., Rheanbreck, Lairg.
 C No. 90 Hogg, D., 10 High Street, Earlstoun, Berwickshire.
 C No. 92 Hogg, D., 10 High Street, Earlstoun, Berwickshire.

MISCELLANEOUS.**CLASS 7. HOME-MADE FLOOR RUG (WOOL).—PREMIUMS, £3, £2, and £1.**

- 1st No. 98 Adamson, Miss Z., Schoolhouse, Glendouglas, Luss.
 2nd No. 106 M'Lean, Mrs H., Havelock, Arrochar.
 3rd No. 102 Harper, Ernest, Mental Hospital, Riccarton, Paisley.
 V No. 115 Saltoun W.R.I., Saltoun, Penciland.
 H No. 109 Noble, Miss M. F., Wrae Farm, Broughton, Peeblesshire.
 C No. 110 Nutten, H. E., Northfleet, 6 Granville Place, Aberdeen.

CLASS 8. SPECIMEN OF EMBROIDERY—White (to be exhibited unwashed).—PREMIUMS, £3, £2, and £1.

- 1st No. 126 Mackay, Miss C., The Towse, Durran, Castletown, Caithness (Nightdress Case).
 2nd No. 127 Telfer, Miss I., Ottercups, Kirkwhelpington, Newcastle-on-Tyne (Tea Cloth).
 3rd No. 128 Veitch, Miss M. M., Schoolhouse, Lochgair, Argyll (Tea Cloth).
 H No. 119 Allan, Miss E. N., Cunzie House, Anstruther (Tea Cloth).

CLASS 9. SPECIMEN OF EMBROIDERY—Coloured.

—PREMIUMS, £3, £2, and £1.

- 1st No. 146 Garland, Miss M., 13 Coningsby Place, Alloa (Portiere).
 2nd No. 140 Cameron, Miss J. K., The Manse, Auchterhouse, Dundee (Portiere).
 3rd No. 140 Gulliver, Mrs J. H., The Old Schoolhouse, Hampton-on-the-Hill, Warwick (Chesterfield Back).
 V No. 136 Blair, Mrs C., Mak' Merry Studio, Macmerry, East Lothian (Chair Seat).
 H No. 147 Gaskell, Mrs J. H., Balchrystie, Kilconquhar (Cushion).
 C No. 129 Allan, Miss E. H., Dean Park Farm, Craigleith, Edinburgh (Fire Screen).
 C No. 143 Forbes, Miss M., East Abbey Lodge, Newmills, Fife (Fire Screen Panel).
 C No. 156 MacIntyre, Miss E. D., Glenlee, Cardross, Dumbartonshire (Picture).
 C No. 158 Mitchell, Mrs C., The Manse, Aberfeldy (Cushion).
 C No. 162 Ross, Mrs D., Newfield, Nigg Station, Ross-shire (Tea Cloth).

CLASS 10. LEATHER GLOVES.—PREMIUMS, £2, £1, and 10s.

- 1st No. 182 Macdonald, Mrs L., South Lodge, Lydgait, Haddington.
 2nd No. 174 Dunchurch Women's Institute, Rugby.
 3rd No. 177 Ellis, Miss G. K., Skene House, Dunecht.
 V No. 176 Dunchurch Women's Institute, Rugby.
 H No. 175 Dunchurch Women's Institute, Rugby.
 C No. 173 Dunchurch Women's Institute, Rugby.
 C No. 178 Ellis, Miss G. K., Skene House, Dunecht.

CLASS 11. SPECIMEN OF LEATHER WORK OTHER THAN GLOVES.—PREMIUMS, £2, £1, and 10s.

- 1st No. 198 Gulliver, Mrs J. H., The Old Schoolhouse, Hampton-on-the-Hill (Writing Case).
 2nd No. 197 Gulliver, Mrs J. H., The Old Schoolhouse, Hampton-on-the-Hill, Warwick (Combined Blotter and Writing Case).
 3rd No. 196 Gulliver, Mrs J. H., The Old Schoolhouse, Hampton-on-the-Hill, Warwick (Week-end Bag).
 V No. 203 King, Mrs K. D., St. Anne's, Barassie, Troon (Books).
 H No. 194 Cumming, Miss M. J., Garvel, Muirhall Road, Kinnoull, Perth (Handbag).
 C No. 188 Baxter, Mrs J., Springwell Terrace, South Queensferry (Handbag).
 C No. 195 Duncan, Miss R., Bruce Cottage, Torryburn, Fife (Pochette).

CLASS 12. SPECIMEN OF FURCRAFT.—PREMIUMS, £2, £1, and 10s.

- 1st No. 214 Allison, Miss M. D., Bruntshiels, Cupar, Fife (Red Fox Stole).
 2nd No. 219 Hogg, Miss M. M., 2 High Street, Coldstream (Gloves).
 3rd No. 216 Dunchurch Women's Institute, Rugby (Gloves).
 V No. 217 Dunchurch Women's Institute, Rugby (Gloves).
 H No. 218 Hogg, Miss M. M., 2 High Street, Coldstream (Gloves).
 C No. 215 Coutts, Mrs A., Kincahle, Guardbridge, Fife (Chinchilla Necklet).

CLASS 13. SPECIMEN OF HAND-PAINTED POTTERY.

—PREMIUMS, £2, £1, and 10s.

- 1st No. 221 Blair, Mrs C., Mak' Merry Studio, Macmerry, East Lothian (Jug).
 2nd No. 223 Blair, Mrs C., Mak' Merry Studio, Macmerry, East Lothian (Jar).
 3rd No. 236 Murray, Miss A. M., U.F. Manse, Aberlady (Bowl).
 V No. 229 Dunlop, Mrs F., Sauchrie, Maybole, Ayrshire (Powder Bowl).
 H No. 225 Downey, Miss M. J., The Whins, Kilrenny, Anstruther (Plaque).
 C No. 230 Henderson, Miss T., St. Rule, Mauchline, Ayrshire (Plate).
 C No. 231 Henderson, Miss T., St. Rule, Mauchline, Ayrshire (Bowl).
 C No. 234 Miller, Miss M. A., Neuk, Lundin Links (Quaich).

CLASS 14. SPECIMEN OF BASKET-WORK (Raffia not eligible).

—PREMIUMS, £2, £1, and 10s.

- 1st No. 246 Laurie, Miss M. S., Union Bank House, Gatehouse, Kirkcudbrightshire (Linen Basket).
 2nd No. 248 Millar, Miss E. S., Easter Kilmany, Kilmany, Dundee (Cutlery Basket).
 3rd No. 250 Niven, Miss E., 12 Church Street, Kilmarnock (Tray).
 H No. 245 Laurie, Miss M. S., Union Bank House, Gatehouse, Kirkcudbrightshire (Tray).
 C No. 244 Hogg, Miss M. M., 2 High Street, Coldstream (Basket).

CLASS 15. BEST COLLECTION OF VEGETABLE-DYED WOOLS.

—PREMIUMS, £2, £1, and 10s.

- 1st No. 251 Hutchison, Miss U. C., The Library, Inval, Haslemere.
 2nd No. 252 Murray, Miss M., Tressidy Hill, Lairg.

CLASS 16. HOME-SPUN YARN—2-3 cuts.

—PREMIUMS, £2, £1, and 10s.

- 1st No. 253 Clark, Mrs W., Newgord, Uyeasound, Lerwick.
 2nd No. 255 Macdonald, Mrs J., Knockintorran, Lochmaddy, North Uist.
 3rd No. 254 Irvine, Miss I. G., Post Office, Mossbank, Lerwick.
 V No. 258 Murray, Miss M., Maidenfield, Mossbank, Lerwick.

CONFINED CLASSES.

Open to Women's Rural Institutes and Members thereof in the whole of Scotland.

CLASS 17. EMBROIDERED BAG—Petit Point included.

—PREMIUMS, £3, £2, and £1.

- 1st No. 266 Reid, Miss G. M., Enfield, Symington, Lanarkshire.
 2nd No. 264 Gourlay, Mrs E. G., Kirkland, Tynron, Thornhill, Dumfriesshire.
 3rd No. 260 Allan, Miss E. H., Dean Park Farm, Craigleith, Edinburgh.

CLASS 18. SPECIMEN OF FILET LACE.—PREMIUMS, £3, £2, and £1.

- 1st No. 275 Munro, Mrs A., Castle Street, Portmahomack, Fearn,
Ross-shire.
2nd No. 276 Winchester, Mrs A. E., The Manse, Arrochar.
3rd No. 277 Winchester, Mrs A. E., The Manse, Arrochar.
V No. 271 Chalmers, Miss J. C., Ancorn, Bower, Wick, Caithness.
H No. 270 Blair, Miss S. E. B., Mak' Merry Studio, Macmerry, East
Lothian.
C No. 274 Mackenzie, Mrs E., Balindrum, Fearn, Ross-shire.

**Confined to Women's Rural Institutes and Members thereof in
the Central Area of Scottish Women's Rural Institutes.**

SPECIAL PRIZES to the Institutes winning the largest number of prizes
in Classes 19 to 25 inclusive. First Prize to count six points, Second
Prize five points, Third Prize four points, V.H.C. three points, H.C.
two points, and C. one point—£3, £2, and £1.

- 1st Largo Women's Rural Institute (22 points).
2nd Cairneyhill Women's Rural Institute (12 points).
3rd Gateside Women's Rural Institute (9 points).

**CLASS 19. FLOOR RUG—made from old material.
—PREMIUMS, 20s., 10s., and 5s.**

- 1st No. 278 Badcock, Mrs, 16 Ordnance Road, Crombie, Dunfermline.
2nd No. 281 Fordyce, Mrs, Wellfield Gardens, Gateside, Fife.
3rd No. 282 Mitchell, Mrs, Wellfield, Gateside, Fife.

CLASS 20. SOCKS—4-ply fingering.—PREMIUMS, 15s., 10s., and 5s.

- 1st No. 285 Erskine, Miss G. M., Myrend, Cairneyhill, Dunfermline.
2nd No. 290 Rodger, Miss E., Kinloch Home Farm, Collessie, Ladybank.
3rd No. 292 Sime, Mrs H. B., Bellevue, Lower Largo.
V No. 291 Short, Miss C. M., Keilbank Cottage, Lundin Links.

**CLASS 21. RAFFIA WORK—on Canvas.
—PREMIUMS, 15s., 10s., and 5s.**

- 1st No. 293 Baxter, Miss E. V., The Grove, Upper Largo.
2nd No. 294 Broomfield, Mrs A., 3 South Feus, Upper Largo.
3rd No. 296 Moubray, Miss E., Naemoor, Rumbling Bridge.

CLASS 22. APPLIQUE.—PREMIUMS, 20s., 10s., and 5s.

- 3rd No. 302 Rintoul, Miss L. J., Lahill, Upper Largo.

CLASS 23. CARDED WOOL QUILT—home-made.
—PREMIUMS, 30s., 20s., and 10s.

(No Entry).

CLASS 24. SPECIMEN OF LEATHER WORK—soft.
—PREMIUMS, 15s., 10s., and 5s.

No Prizes awarded.

CLASS 25. TEA CLOTH—with crochet border.
—PREMIUMS, 30s., 20s., and 10s.

- 1st No. 309 Walker, Mrs M. B., Rosemary Cottage, Blairadam.
2nd No. 308 Ramsay, Miss B. W., Inchewan, Birnam, Dunkeld.
3rd No. 307 Fraser, Miss J. H., Schoolhouse, Charleston, Fife.
V No. 306 Bennie, Mrs E., South Woodend, Bonnybridge.

HORSE SHOEING.

**Open to Shoeing-Smiths from any part of Great Britain,
Northern Ireland, and Irish Free State.**

Gold Watch, given by Messrs William Martin, Sons & Co., Coatbridge, *to the winner of the First Prize in Class 1.*

Canteen of Cutlery, given by Messrs Neilson & Cleland, Ltd., Coatbridge, *to the winner of Second Prize in Class 1.*

Gold Medal, given by the Mustad Nail Company, *to the winner of Third Prize in Class 1.*

Gold Medal, given by Capewell Horse Nail Company, *to the winner of Fourth Prize in Class 1.*

CLASS 1. FARM HORSES (OPEN CLASS). 1st Prize, £5 and Gold Watch; 2nd Prize, £5 and Canteen of Cutlery; 3rd Prize, £5 and Gold Medal; 4th Prize, £4 and Gold Medal; 5th Prize, £3; 6th Prize, £2; 7th Prize, £2; 8th Prize, £1; 9th Prize, £1.

1st No. 3 Hamilton, J. J., Twynholm, Kirkcudbrightshire.

2nd No. 49 Ritchie, John, 3 Little Belmont Street, Aberdeen.

3rd No. 28 Callander, James, 109 High Street, Laurencekirk.

4th No. 5 Reid, Robert, Rathven Smithy, Buckie.

5th No. 20 Nicol, Alexander, Muir, Alford.

6th No. 38 Duncan, James, Newmill, Newburgh, Aberdeenshire.

7th No. 37 Jeffray, Alexander, Niddrie Mill, Portobello.

8th No. 44 Fenwick, Robert, Victoria Forge, Dundee.

9th No. 2 Mackie, William C., Glasgoforest, Kinellar.

Clock, given by the Scottish Iron & Steel Co., Ltd., Glasgow, *to the winner of First Prize in Class 2.*

Canteen of Cutlery, given by Messrs Neilson & Cleland, Ltd., Coatbridge, *to the winner of Second Prize in Class 2.*

Gold Medal, given by the Mustad Nail Company, *to the winner of Third Prize in Class 2.*

CLASS 2. FARM HORSES (Juniors under twenty-five years of age).
—1st Prize, £5 and Clock; 2nd Prize, £3 and Canteen of Cutlery;
3rd Prize, £2 and Gold Medal; 4th Prize, £1.

1st No. 60 Harvey, Edward, 11 Brown Street, Perth.

2nd No. 73 Davidson, Alexander, 10 Cathcart Street, Buckie.

3rd No. 68 Grant, James, Forest of Glentanar, Aboyne.

4th No. 61 Wood, William, Newmill, Newburgh, Aberdeenshire.

LIVE STOCK JUDGING COMPETITION.

**Open to all persons not exceeding 25 years of age at the
date of the competition.**

“Glasgow Herald” Challenge Cup, value £50, *to be awarded each year to the winning team in the Inter-College Contests.* Given by Messrs George Outram & Co., Ltd., Glasgow.

West of Scotland Agricultural College (Girls' Team), 298 points.

Gold Medal to be awarded to the highest individual scorer, irrespective of whether the winner is or is not a College Entrant. Given by Messrs George Outram & Co., Ltd., Glasgow.

			Points.
1st	equal	{ Park, Miss M., Brunstane, Portobello,	68
		{ Macgregor, Duncan, Peterhead Farm, Auchterarder,	68
		(On this occasion two medals were awarded).	

INDIVIDUAL COMPETITION.

PREMIUMS, £5, £4, £3, £2, £1.

			Points.
1st	equal	Park, Miss M., Brunstane, Portobello,	68
2nd		Macgregor, Duncan, Peterhead Farm, Auchterarder,	68
3rd	equal	Gordon, P. M., Windygates Farm, Ceres, Fife,	66
4th		Mitchell, William, Easter Essendy, Blairgowrie,	66
5th	equal	Melville, Harry W., Balmullo House, Leuchars,	64
		Bell, William, junr., Craiggan Farm, Muthill,	64

TEAM COMPETITION.

1st Prize, £10, and 5 Medium Silver Medals.

West of Scotland Agricultural College (Girls' Team).

			Points.
Dron, Miss J. H. H., Poultry Department, Kilmarnock, ....	....	....	62
M'Leod, Miss H. S., Poultry Department, Kilmarnock, ....	....	....	62
Unkles, Miss I. M., Poultry Department, Kilmarnock, ....	....	....	62
Doull, Miss P., Poultry Department, Kilmarnock, ....	....	....	56
Simpson, Miss H., Poultry Department, Kilmarnock, ....	....	....	56
			<hr/>
			298

2nd Prize, £5, and 5 Medium Bronze Medals.

West of Scotland Agricultural College (Mens' Team).

			Points.
Edwards, Joseph, Dairy School, Kilmarnock, ....	....	....	60
Kilpatrick, William J., Craigie Mains, Kilmarnock, ....	....	....	60
Brown, James A., junr., Dairy School, Kilmarnock, ....	....	....	58
Young, William, Skerrington Mains, Hurlford, ....	....	....	58
Kerr, William, Knockshinnoch, New Cumnock, ....	....	....	56
			<hr/>
			292

Special Prize for College Team placed highest in Competition, £5.

West of Scotland Agricultural College (Girls' Team), 298 points.

NEW IMPLEMENTS.

The Judges, having inspected the new implements submitted for competition, have awarded the Society's Silver Medal to the following:—

- Bamfords, Messrs, Ltd., Uttoxeter, Staffs (No. 102)—A 4-BHP. Vertical Petrol Water-Cooled Engine.
 Muirhead, Messrs James & Sons, 1276 Maryhill Road, Glasgow (No. 1289)—A Ventilator for Byres, etc.
 Scarlett, Robert L., Sweethope, Musselburgh (No. 1348)—A "Mysto" Seed Sower.

JUDGES.

Shorthorn.—John Crombie, Hase-
lor Farm, Evesham, Worcs.

Aberdeen-Angus.—C. F. Tulloch,
Braevail of Lethen, Nairn.

Galloway.—James Clark, Auch-
en-hay, Corsock, Dalbeattie.

Belted Galloway.—J. F. Sproat,
Boreland of Anwoth, Gatehouse-
of-Fleet.

Highland.—John R. Campbell of
Glencassley, Rosehall, Invershin.

Ayrshire.—John Young, Mous-
wald Grange, Ruthwell.

British Friesian.—Robert Wall-
ace, Mardley Bury, Knebworth,
Herts.

Red Poll.—Sam Woodiwiss,
Graveleys, Great Waltham, Chelms-
ford.

Clydesdale Stallions and Colts.—
Andrew Renwick, Grindon, Nor-
ham-on-Tweed.

*Clydesdale Geldings and Draught
Geldings in Harness*.—David Allison
Duddingston, South Queensferry.

Clydesdale Mares and Fillies.—
Peter Dewar, Arnprior, Kippen,
R.S.O.

Shires.—Thomas Forshaw, The
Stud, Carlton-on-Trent, Newark.

Hunters and Riding Ponies.—
G. H. J. Dove, Estate Office,
Mellerstain, Gordon.

Highland Ponies.—Thomas
Wooley, Commercial Hotel, Bonar
Bridge.

Western Island Ponies.—Miss A.
Stirling Maxwell, Pollok House,
Pollokshaws.

Shetland Ponies.—Graham Clark,
Ashbank, Maberley Street, Aber-
deen.

Harness Classes.—Walter Briggs,
Linden Hall, Borwick, near Carn-
forth, Lancs.

*Blackface Sheep, Males excluding
Tup Lambs*.—James Mitchell, jun.,
Henderland, Selkirk.

*Blackface Sheep, Females and
Tup Lambs*.—Donald M'Dougall,
Dall, Ardeonaig, Killin.

Cheviot.—Walter J. Grieve,
Southfield, Hawick.

Border Leicester.—William Faul-
der, Oak Bank, Longtown, Cumber-
land.

Half-Bred.—J. R. C. Smith,
Mowhaugh, Yetholm, Kelso.

Oxford-Down.—A Wyllie, Castle-
mains, Gifford.

Suffolk.—A. N. Bocock, The Hall
Farm, near Newmarket.

Shropshire.—William Barnet,
Wood Orchard Farm, Audlem,
Cheshire.

Dorset Horn.—Alfred Johnson,
Symondsbury, nr. Bridport, Dorset.

Fat Sheep.—J. R. C. Smith,
Mowhaugh, Yetholm, Kelso.

Goats.—Mrs Reginald Pease,
Sledwich, Barnard Castle.

Large White Pigs.—John Filling-
ham, The George Hotel, Grantham.

Middle White.—James Allsup,
Home Farm, Whittingham, Preston,
Lancs.

Large Black.—Harry E. Bastard,
Tinten Manor, St. Tudy, S.O.,
Cornwall.

Poultry.—W. H. Silvester, The
Hawthorns, Hillsborough Park,
Sheffield—Classes 1 to 22, 61 to 72,
and 93 to 100; Walter Bradley,
Homestall Poultry Farm, East
Grinstead—Classes 23 to 60; Thos.
Fullarton, Loans, Troon—Classes
73 to 92; H. S. Anthony, Euxton,
Chorley, Lancs.—Classes 101 to
123.

Rabbits.—George A. Townsend,
Southfield, Horsforth, near Leeds.

Honey, &c.—John Anderson,
M.A., B.Sc., 186 Forrest Avenue,
Aberdeen.

Dairy Produce.—William Swan
(A. Osborne & Sons), 45 Candleriggs,
Glasgow.

Wool.—Herbert C. Redman, 30
Lomond Road, Trinity, Edinburgh.

Rural Industries.—Miss Bruce,
111A George Street, Edinburgh—
Classes 1, 2, 3, 4, 5, 6, 15, 16, 20;
J. Mountford, of Messrs Robert
Maule & Son, Princes Street, Edin-
burgh—Classes 7, 19, 23; Miss
Paterson, Edinburgh College of
Art, Edinburgh, and Miss A. Mor-
ton, 29 Polwarth Gardens, Edin-
burgh—Classes 8, 9, 10, 11, 13, 17,
18, 21, 22, 24, 25; Mrs Balfour
Graham, Levenbank, Leven—Class
12; Miss A. Firth, 35 Howard
Place, Edinburgh—Class 14.

Horse-Shoeing.—George C. Inglis,
M.R.C.V.S., 12 Bedford Place,
Alloa; James Hall, Blacksmith,
Halfway House, Paisley Road,
Cardonald, Glasgow; William
Stephen, Blacksmith, 6 Manse
Terrace, Turriff.

ATTENDING MEMBERS.

SHORTHORN.—*The Earl of Elgin and Kincardine, C.M.G., J.P. Ross Taylor, John Finlayson, A. H. Anderson.*

ABERDEEN-ANGUS. — *W. Betts Donaldson, A. Y. Allan, W. F. M'Laren, James Stirling.*

GALLOWAY.—*James M'Queen, J. Bryce Duncan, W. J. Thomson, John Dempster.*

BELTED GALLOWAY. — *Colonel Robert W. Walker, William Davie.*

HIGHLAND. — *Archibald Whyte, Duncan Cameron.*

AYRSHIRE.—*William Low, John W. Prentice, John Fisher, Matthew Howie.*

BRITISH FRIESIAN.—*Hon. T. G. P. Corbett, Peter M'Intyre, Edward H. Macfarlane, William Edmond.*

RED POLL.—*William C. Hunter, T. G. Wilson.*

CLYDESDALE STALLIONS AND COLTS.—*James M'Clean, William Carrick, John Stirling, Alexander Paterson, James Walls.*

CLYDESDALE GELDINGS AND DRAUGHT GELDINGS IN HARNESS.—*William M'Laren, Robert Binnie, James M'Laren, Jun.*

CLYDESDALE MARES AND FILLIES.—*A. A. Hagart Speirs, Robert M'Gee T. L. Reid, William Peat, Peter Robertson.*

SHIRES. — *William Meiklem, James Adam, John Risk.*

HUNTERS AND RIDING PONIES.—*Colonel F. J. Carruthers, Major Robert W. Sharpe, James Weir, Bailie J. P. Younger.*

HIGHLAND PONIES.—*Alexander Munro, Mrs Marian Watters.*

WESTERN ISLAND PONIES.—*Brig. General Archibald Stirling, John Scrimgeour.*

SHETLAND PONIES.—*James Gray, Bailie John M'Gilchrist, Miss Catherine E. Aitkenhead, N.D.A., N.D.D.*

HARNESS CLASSES.—*Robert Park, John King, Hugh Marshall, Major C. Home Graham-Stirling.*

BLACKFACE SHEEP.—*John Elliot, Thomas Templeton, Parlan Macfarlan, Charles D. M. Ross, John Bilsland, John Dewar.*

CHEVIOT.—*P. O. Turnbull, Andrew Mitchell, Laurence D. M'Laren, William M'Nair Snadden.*

BORDER LEICESTER.—*John Robson, Jun., William Drysdale, John James Thomson.*

HALF-BRED.—*Dr Thomas G. Nasmyth, Donald M'Laren, Jack Riddick.*

OXFORD-DOWN. — *Alexander Niven, Duncan M'Callum Stewart.*

SUFFOLK.—*Bailie William Poole, James Watson, T. Douglas Wallace.*

SHROPSHIRE.—*Alfred H. Reid, W. Gilchrist Macbeth.*

DORSET HORN.—*Alfred H. Reid, W. Gilchrist Macbeth.*

FAT SHEEP.—*Dr Thomas G. Nasmyth, Donald M'Laren, Jack Riddick.*

GOATS.—*The Master of Polwarth, John Gray.*

LARGE WHITE PIGS.—*W. Watson Murray, John Thomson, Archibald M'Naught.*

MIDDLE WHITE.—*Peter Grant, William Bryce, Luke Taylor.*

LARGE BLACK.—*Provost A. P. Moir, Bailie J. Forrester-Paton, Dean of Guild Grant.*

POULTRY.—*Dr J. F. Tocher, Claud A. Allan, Colonel Robert Haig, T. Mercer Sharp.*

RABBITS.—*David M. Aitkenhead, A. B. Nicolson.*

HONEY, ETC.—*A. Aikman Blair; Bailie Jeffrey.*

DAIRY PRODUCE.—*Sir Thomas Paxton, Bart, LL.D., John F. Christie, Major C. Falconer-Stewart.*

WOOL.—*Captain Campbell Willis, Robert Lennox.*

RURAL INDUSTRIES.—*Dr R. Stewart MacDougall, John Monteath, Daniel M'Ewen, Andrew C. Buchanan.*

HORSE-SHOEING.—*John W. Prentice, William M'Laren, Robert M'Gee, James Mustard, William Thomson, Robert Gray.*

VETERINARY DEPARTMENT.

CLASS EXAMINATIONS, 1929.

Silver Medals were awarded to the following :—

GLASGOW VETERINARY COLLEGE.

Junior Anatomy	Samuel Jamieson, Glasgow.
Chemistry	Samuel Jamieson, Glasgow.
Biology	Helen J. Mitchell, Bearsden.
Senior Anatomy	David Mossinson, Palestine.
Physiology	William A. Milligan, Annan.
Zootechny	William A. Milligan, Annan.
Materia Medica	Matthew H. W. Miller, Paisley.
Pathology	Iain A. Gillespie, Bruichladich.
Hygiene	Matthew H. W. Miller, Paisley.
Surgery	Donald W. Menzies, Drumnadrochit.
Medicine	Thomas L. May, Glasgow.

11 Large Silver Medals, £10, 3s. 6d.

ROYAL (DICK) VETERINARY COLLEGE.

Junior Anatomy	W. B. Forrest, Kirkcaldy.
Chemistry	W. B. Forrest, Kirkcaldy.
Biology	W. B. Forrest, Kirkcaldy.
Senior Anatomy	H. M'Vean, Craigellachie.
Physiology	W. G. Edwards, Nelson.
Zootechny	J. Johnston, Brechin.
Materia Medica	W. G. Robinson, Carlisle.
Pathology	L. Sahai, India.
Hygiene	W. G. Robinson, Carlisle.
Surgery	A. P. Steels, Ipswich.
Medicine	J. B. M'Kinna, Huddersfield.

11 Large Silver Medals, £10, 3s. 6d.

DISTRICT COMPETITIONS, 1929.

18 Districts—	12 Grants of £12 each; 2 of £11, 10s.; 1 of £11, 8s.;	
	1 of £11; 1 of £10, 7s. 6d.; and 1 of £8	£207 15 6
8 „	Grants of £15 each	120 0 0
28 „	Special Grants: Medals, £15, 14s. 6d.	202 8 9
	Medals for Shows (36 large)	33 6 0
	Medals for Cottages, Gardens, &c.	0 0 0
46 „	Medals for Hoeing Competitions, 1928-29	17 16 6
179 „	Medals for Ploughing, 1928-29	89 10 0
Long Service Certificates, £23, 1s. 8d.; Gold Medals, £59, 7s. 6d.;		
and Silver Medals, £24, 13s. 6d. (1928-29)		107 2 8
		£777 19 5

ABSTRACT OF PREMIUMS.

District Competitions	£670 16 9
Long Service Awards	107 2 8
Veterinary Colleges (22 Medals)	20 7 0
	£798 6 5

ABERDEEN SHOW, 1928.

ALTERATIONS IN PRIZE LIST.

On account of animals failing to comply with the Regulations as to calving, foaling, and farrowing, the following changes have taken place in the list of animals for which prizes were awarded :—

CATTLE.

ABERDEEN-ANGUS.

CLASS 16. COW or HEIFER, born on or after 1st December 1925.—
PREMIUMS, £10, £5, £3, and £2.

- | | | |
|-----|---------|---|
| 1st | No. 162 | Grant, Sir George MacPherson, Bart., Ballindalloch Castle, Ballindalloch, Heifer, "Joan of Ballindalloch" (81,146). |
| 2nd | No. 167 | Wallace, Falconer L., of Candacraig and Balcairn, Strathdon, Heifer, "Evergreen of Candacraig" (82,644). |
| | No. 161 | Cumming, J. F., O.B.E., Kinermory Farm, Aberlour, Heifer, "Juneberry of Kinermory" (80,784). |
| 3rd | No. 164 | Kennedy, Colonel Norman, D.S.O., of Doonholm, Ayr, Heifer, "Madeira of Doonholm" (81,393). |
| 4th | No. 163 | Grant, Sir George MacPherson, Bart., Ballindalloch Castle, Ballindalloch, Heifer, "Evolerica of Ballindalloch." |

GALLOWAY.

CLASS 23. COW or HEIFER, born on or after 1st December 1925.—
PREMIUMS, £10, £5, £3, and £2.

- | | | |
|-----|---------|---|
| | No. 206 | Buchanan-Jardine, Sir John William, of Castlemilk, Bart., Castlemilk, Lockerbie, Heifer, "Ivy of Castlemilk" (30,918). |
| 1st | No. 210 | Paterson, R. Jardine, Balgray, Lockerbie, Heifer, "Joan 2nd of Balgray" (30,935). |
| 2nd | No. 208 | Donaldson, W. B., Auchineden, Blanefield, Heifer, "Beauty of Auchineden" (30,798). |
| 3rd | No. 207 | Buchanan-Jardine, Sir John William, of Castlemilk, Bart., Castlemilk, Lockerbie, Heifer, "Lady Fashion of Castlemilk" (30,924). |
| | No. 209 | Gourlay, Francis N. M., Kirkland, Tynron, Thornhill, Dumfriesshire, Heifer, "Craigneston Fashion" (30,854). |
| 4th | No. 211 | Paterson, R. Jardine, Balgray, Lockerbie, Heifer, "Lady of Balgray" (30,936). |

HIGHLAND.

CLASS 34. COW or HEIFER, born in 1925.—PREMIUMS,
£10, £5, £3, and £2.

- | | | |
|--|---------|--|
| | No. 274 | Southesk, The Earl of, Kinnaird Castle, Brechin, Heifer, "Sidonia of Southesk" (9827). |
| | No. 275 | Southesk, The Earl of, Kinnaird Castle, Brechin, Heifer, "Lady Ruth II." (9828). |

The animals failing to qualify are marked thus ().*

AYRSHIRE.

CLASS 41. HEIFER, born in 1926.—PREMIUMS,
£10, £5, and £3.

- * No. 300 Barr, Thomas, Hobsland, Monkton, "Willoxton Madge" (8817).
- 1st No. 302 Stewart, Sir Hugh Shaw, Bart., C.B., of Ardgowan, Inverkip,
"Ardgowan Sally" (9473).
- 2nd No. 299 Airlie Estates Company, Home Farm, Cortachy Castle, Kirriemuir,
"Cortachy Tibby 3rd" (10,036).
- * No. 301 Cowhill Estate Company, Limited, Holywood, Dumfries, "Cowhill Eleanor" (8768).

HORSES.

DRAUGHT MARES.

CLASS 71. YELD MARE, born before 1925.—PREMIUMS, £15, £9, £6, and £4.

- 1st No. 529 Murdoch, Alexander, East Hallside, Hallside, Glasgow, "Orange Blossom."
- 2nd No. 532 Sloigh, John P., of St John's Wells, Fyvie, "Raysun" (56,197).
- * No. 528 Gray, James, Crawfordston, Kippen, "Margaret."
- 3rd No. 525 Beck, G. M., The Lane, Ravenstonedale, Westmorland, "Craigie Beauty" (56,012).
- 4th No. 524 Argo, George, Petty, Fyvie, "Dunure Roseway" (53,302).

SHIRE.

CLASS 77. YELD MARE or FILLY, born before 1927.—
PREMIUMS, £15, £9, £6, and £4.

- * No. 582 Foster, G. R. C., Anstey Hall, Trumpington, Cambridge, Mare,
"Eryl Lady Grey" (88,450).
- * No. 580 Cumber, William J., Theale, Reading, Mare, "Foscote Disdain"
(114,252).
- * No. 583 Greenwell, Sir Bernard, Bart., Marden Park, Woldingham, Caterham Valley, Surrey, Mare, "Cippenham Muriel" (102,248).
- 1st No. 581 Devonshire, The Duke of, K.G., Chatsworth, Bakewell, Filly,
"Ledwyche Pearl" (120,991).
- * No. 577 Barker, C. & M., Stilton House, Helmsley, Yorkshire, Mare,
"Edingale Rose" (118,141).

PIGS.

MIDDLE WHITE.

CLASS 156. SOW, born in 1927.—PREMIUMS, £8, £4, and £2.

- 1st No. 1128 Chivers & Sons, Limited, Histon, Cambridge, "Histon Woodlands 6th."
- 2nd No. 1129 Chivers & Sons, Limited, Histon, Cambridge, "Histon Woodlands 7th."
- * No. 1130 Gamlen, Dr H. E., 87 Jesmond Road, Newcastle-on-Tyne, "Fordon Merrymaid" (Ear No. 6751).
- 3rd No. 1132 Smith-Sligo, Captain R. W., Inzievar, Oakley, Fife, "Inzievar Amazon 2nd."

The animals failing to qualify are marked thus ().*

NEW IMPLEMENTS.

The Judges, having inspected the New Implements submitted for competition, awarded the Society's Silver Medal to the following:—
William Henderson & Sons, St Germain Street, Catrine, Ayrshire (No. 1896).—"Maybet" Two-speed Winch.

STATE OF THE FUNDS

OF

THE HIGHLAND AND AGRICULTURAL SOCIETY OF SCOTLAND

As at 30th NOVEMBER 1929

I. BRITISH GOVERNMENT SECURITIES—			
£19,800 5 per cent War Stock, 1920 47, at 99 $\frac{7}{8}$	.	£19,275	17 6
£1,679, 13s. 4d. 2 $\frac{1}{2}$ per cent Consolidated Stock, at 53	.	890	4 5
£8,000 4 $\frac{1}{2}$ per cent Conversion Loan, at 94	.	7,520	0 0
£6,200 3 per cent Local Loans, at 62	.	3,844	0 0
£4,000 3 $\frac{1}{2}$ per cent Conversion Loan, at 74 $\frac{1}{2}$	.	2,975	0 0
		<u>£34,505</u>	1 11
II. HERITABLE BONDS—			
£15,660 at 4 $\frac{1}{2}$ per cent . . . . .	.	15,660	0 0
III. RAILWAY DEBENTURE AND PREFERENCE STOCKS—			
£17,050 London and North-Eastern Railway Co. 3 per cent Debenture Stock, at 56 $\frac{1}{2}$	.	£9,633	5 0
£11,554 Do. do. 4 per cent do., at 78 $\frac{1}{2}$	.	8,521	1 6
£16,105 London Midland and Scottish Railway Co. 4 per cent Debenture Stock, at 76 $\frac{1}{2}$	.	12,320	6 6
£1,500 Do. do. 4 per cent Preference Stock, at 67 $\frac{1}{2}$	.	1,016	5 0
£703 Southern Railway Co. 4 per cent Debenture Stock, at 76 $\frac{1}{2}$	.	535	3 2
£450 Do. do. 5 per cent Preference Stock, at 85 $\frac{1}{2}$	.	384	15 0
£112 Do. do. 5 per cent Guaranteed Stock, at 94 $\frac{7}{8}$	.	106	5 2
		<u>32,517</u>	1 4
IV. BANK STOCKS—			
£5,030 0 0 Royal Bank of Scotland, at 350	.	£17,605	0 0
£2,218 16 5 Bank of England, at 248	.	5,502	13 6
£1,110 13 4 Bank of Scotland, at 365	.	4,053	18 9
2,850 "B" Shares, Barclays Bank, at 55s.	.	7,837	10 0
		<u>34,999</u>	2 3
V. COLONIAL GOVERNMENT STOCKS—			
£2,500 Dominion of Canada Registered 3 $\frac{1}{2}$ per cent Stock (1930-50), at 80 $\frac{1}{2}$	.	£2,012	10 0
£2,500 New South Wales Inscribed 5 per cent Stock (1935-55), at 90 $\frac{1}{2}$	.	2,262	10 0
£2,500 Natal Inscribed 3 $\frac{1}{2}$ per cent Stock (1914-39), at 87	.	2,175	0 0
£2,000 Western Australia Inscribed 4 per cent Stock (1942-62), at 74 $\frac{1}{2}$	.	1,490	0 0
£2,000 New Zealand Government 5 per cent Inscribed Stock (1946), at 101 $\frac{1}{2}$	.	2,030	0 0
£1,120 Victorian Government 3 $\frac{1}{2}$ per cent Inscribed Stock, at 71	.	795	4 0
		<u>10,765</u>	4 0
Carry forward . . . . .	.	£128,446	9 6

	Brought forward	£128,446 9 6
VI. ANNUITY STOCK—		
£32 Edinburgh and Leith Corporation Gas Commissioners, at 19½		634 0 0
VII. ESTIMATED VALUE of Buildings—		
3 George IV. Bridge	£4,000 0 0	
8 Eglinton Crescent	4,000 0 0	
	£8,000 0 0	
VIII. ESTIMATED VALUE of Furniture, Paintings, Books, &c.		
	1,000 0 0	
		9,000 0 0
IX. ARREARS OF SUBSCRIPTIONS considered recoverable		
		386 18 0
X. BALANCES at 30th November 1929		
		1,886 19 8
AMOUNT OF GENERAL FUNDS		£140,354 7 2
XI. SPECIAL FUNDS—		
TWEEDDALE GOLD MEDAL FUND—		
Heritable Bond, at 4½ per cent		£500 0 0
£100 3 per cent Local Loans Stock, at 62		62 0 0
Sum on Deposit Receipt with British Linen Bank		19 11 0
		£581 11 0
FIFE AND KINROSS PERPETUAL GOLD CHALLENGE CUP FUND—		
£268 London and North-Eastern Railway Co. 3 per cent Debenture Stock, at 56½	£161 8 5	
£201 Do. do. 4 per cent First Guaranteed Stock, at 71½	143 14 4	
Sum on Deposit Receipt with British Linen Bank	39 1 0	
		334 3 9
PAISLEY PERPETUAL GOLD CHALLENGE CUP FUND—		
£802 London and North-Eastern Railway Co. 3 per cent Debenture Stock, at 56½	£453 2 7	
Sum on Deposit Receipt with British Linen Bank	84 17 0	
		537 19 7
RENFREWSHIRE PERPETUAL GOLD CHALLENGE CUP FUND—		
£668 London and North-Eastern Railway Co. 3 per cent Debenture Stock, at 56½	£378 8 5	
Sum on Deposit Receipt with British Linen Bank	78 6 6	
		456 14 11
WILLIAM TAYLOR MEMORIAL PRIZE FUND—		
£401 London and North-Eastern Railway Co. 3 per cent Debenture Stock, at 56½	£226 11 3	
Sum on Deposit Receipt with British Linen Bank	65 5 6	
		291 16 9
WILLIAM DUTHIE PERPETUAL SILVER CHALLENGE CUP FUND—		
£260 2½ per cent Consolidated Stock, at 53		137 16 0
BALANCES WITH BRITISH LINEN BANK at 30th November 1929		
		59 17 2
AMOUNT OF SPECIAL FUNDS		£2,399 19 2

J. E. KERR, *Chairman.*F. J. CARRUTHERS, *Hon. Secretary.*GEO. JAMES GREGOR, C.A., *Auditor.*

ABSTRACT of the ACCOUNTS of the HIGHLAND and CHARGE.

1. BALANCES as at 30th November 1928	.	.	.	£742 15 5
2. ARREARS of Subscriptions outstanding at 30th November 1928	.	.	.	£438 0 0
Whereof due by Members who have compounded for life, and whose arrears are thereby extinguished.	.	.	.	12 0 6
				<hr/> 425 19 6
3. LOAN over Heritable Property repaid	.	.	.	690 0 0
4. INTERESTS AND DIVIDENDS—				
(1) Interests—				
On Heritable Bonds, less Income-tax	.	.	.	£608 3 10
On Railway Debenture and Preference Stocks, do.	.	.	.	1,387 5 2
On Colonial Government Stocks, do.	.	.	.	415 7 4
On Annuity Stock, do.	.	.	.	25 12 0
On Edinburgh Corporation Loans, do.	.	.	.	44 4 8
On British Government Stocks, do.	.	.	.	1,547 7 10
				<hr/> £4,028 0 10
(2) Dividends on Bank Stocks, less Income-tax	.	.	.	1,393 10 10
				<hr/> 5,421 11 8
5. SUBSCRIPTIONS—				
Annual Subscriptions	.	.	.	£2,624 11 0
Life Subscriptions.	.	.	.	789 12 0
				<hr/> 3,414 3 0
6. 'TRANSACTIONS'	.	.	.	16 16 11
7. INCOME-TAX repaid for year to 5th April 1929	.	.	.	1,110 3 3
8. RECEIPTS from Edinburgh Show, 1927	.	.	.	4 0 0
9. RECEIPTS from Aberdeen Show, 1928	.	.	.	229 8 0
10. RECEIPTS from Alloa Show, 1929	.	.	.	16,999 3 1
11. TEMPORARY LOANS uplifted	.	.	.	3,000 0 0
12. QUARANTINE STATION	.	.	.	21 7 5
13. MISCELLANEOUS	.	.	.	1 16 6
SUM OF CHARGE	.	.	.	£32,077 4 9

AGRICULTURAL SOCIETY of SCOTLAND for Year 1928-1929.

DISCHARGE.

1. ESTABLISHMENT EXPENSES—	
Salaries and Wages—Secretary, £1250; Chief Clerk, £400; other Clerks, £436, 18s. 4d.; Typist, £150; Messenger's Wages, £172, 1s. 8d.; Cleaning, £53; Retiring Allowance to Mrs Simpson, £30; Allowance to Mrs Cowie and Family, £200; Allowance to Mrs Brown, £22	£2,713 15 0
Feu-duty, £45, 14s. 9d.; Rates and Taxes, £178, 0s. 7d.	228 15 4
Coal, Gas, and Electric Light	51 15 0
Insurances, £77, 16s. 11d.; Special Annuity Premium, £51, 8s. 9d.; Telephone and Telegrams, £41, 8s. 11d.; Repairs and Furnishings, £88, 5s. 1d.	208 9 8
	<u>£3,197 15 0</u>
2. FEE to Auditor of Accounts for 1927-1928	75 0 0
3. EDUCATION—	
N.D.A. Examination	75 5 2
4. CHEMICAL DEPARTMENT—	
Fee to Chemist	£100 0 0
Analyses for Members and Expenses	837 13 10
	<u>437 13 10</u>
5. VETERINARY DEPARTMENT—	
Medals to Students	20 7 0
6. DAIRY DEPARTMENT—	
Expenses of Examination held at Kilmarnock	£101 15 11
Less Entry Fees	119 14 0
	<u>282 1 11</u>
7. SOCIETY'S 'TRANSACTIONS'	1,710 9 0
8. ORDINARY PRINTING, £256, 18s.; Advertising, £49; Stationery, Books, &c., £127, 8s.; Postages, £162, 4s. 10d.	595 5 10
9. SALARY to Consulting Engineer	250 0 0
10. MISCELLANEOUS Payments	221 15 6
11. INVESTMENT made	70 8 0
12. SUMS lodged on Temporary Loan	3,000 0 0
13. EXPENSES in connection with Aberdeen Show, 1928	272 1 0
14. EXPENSES in connection with Alloa Show, 1929—	
Premiums, £8719, 15s.; Medals, £37, 17s. 6d.; Expenses of Show, £13,240, 10s. 9d. (as per page 397)	16,998 12 3
15. PREMIUMS and Medals for Local Shows and District Competitions	581 10 9
16. CERTIFICATES and Medals for Long Service	110 10 2
17. EXPENSES in connection with visiting sites for future Shows and attending Meetings	29 6 2
18. SPECIAL GRANTS	440 0 0
19. NEW Property at No. 8 Eglinton Crescent—	
Payments to Account of Contract Work, &c.	1,119 0 0
20. SPECIAL LOSSES incurred	141 19 6
21. ARREARS removed from Subscription List at 30th November 1929	174 6 0
22. ARREARS of Subscriptions outstanding at 30th November 1929	386 18 0
23. BALANCES at 30th November 1929—	
On Account Current with Royal Bank of Scotland—	
Edinburgh Account	£1643 10 8
London Account	237 10 0
	<u>£1881 0 8</u>
In hands of Secretary	5 19 0
	<u>1,886 19 8</u>
SUM OF DISCHARGE	<u>£32,077 4 9</u>

J. E. KERR, *Chairman*.

F. J. CARRUTHERS, *Hon. Secretary*.

GEO. JAMES GREGOR, C.A., *Auditor*.

ABSTRACT of the ACCOUNTS

CHARGE.

1. LOCAL SUBSCRIPTIONS . . . . .	...
2. AMOUNT COLLECTED DURING SHOW—	
Gates	£7,164 17 1
Grand Stand	1,462 16 8
Catalogues and Awards	690 5 10
Tickets sold	24 10 0
Rent of Motor Garage and Chauffeurs' Tickets	397 0 3
Cloak-Rooms and Lavatories	127 5 11
	£9,866 15 9
3. FORAGE SOLD	8 19 5
4. RENT OF STALLS	5,735 15 0
5. RENT OF REFRESHMENT BOOTHS	620 0 0
6. ADVERTISEMENTS IN CATALOGUE AND PREMIUM LIST	279 17 6
7. SUBSCRIPTIONS IN AID OF PREMIUMS	394 2 0
8. TELEPHONE CALLS IN SHOWYARD	71 15 4
9. INTEREST ON TEMPORARY LOANS	21 13 1
10. MISCELLANEOUS	0 5 0

£16,999 3 1

<i>Note.</i> —From the credit balance of	£17 10 10
Deduct Premiums undrawn at 30th November	£237 10 0
Amount payable for restoration of ground	100 0 0
	<u>337 10 0</u>

£319 19 2

From the above balance there falls to be deducted sums due by Exhibitors for fitting up of stands, amounting to	224 7 7
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Making the probable deficit £95 11 7

EDINBURGH, 8th January 1930.

of the ALLOA SHOW, 1929.

DISCHARGE.

1. SHOWYARD—		
Fitting up of Showyard	£3,800	0 0
George Gordon & Co. Ltd.—Hire of Timber	3,052	16 3
Rosettes, £41, 10s. ; Penning Poultry and Rabbits, £36, 4s. 9d. ; Horse-Shoeing, £8, 14s. 8d. ; Towels, &c., £52, 8s. 1d. ; Cutting Grass, £17, 10s. 9d. ; Special Roadway, £40 ; Graz- ing Rent, Isolation Building, &c., £108, 5s.	£304	13 3
Railway Carriage and Cartage on Sleepers, £111, 2s. ; on Office Luggage, Poultry, Rabbits, &c., £25, 6s. 6d.	136	8 6
Salary to John Reid, Showyard Erector	441	1 9
2. FORAGE and Bedding for Stock	500	0 0
3. POLICE	435	5 0
4. TRAVELLING EXPENSES of Judges, Stewards, and Staff	164	2 0
5. HOTELS AND LUNCHEONS—		
Hotels for Directors, Stewards, and Judges	239	11 6
Luncheons in Showyard for Directors, Judges, Attending Members, Members of Committee, Pressmen, Staff (including accommodation), Breakfasts, and Teas	514	5 6
6. ASSISTANTS and Show Staff	753	17 0
7. MUSIC	667	16 10
8. PRINTING, Members' Badges, and Stationery	115	15 0
9. ADVERTISING and Bill-posting	1,429	1 11
10. GRANTS to Mrs Traill, £5 ; Forestry Exhibition, £40 ; Bacon Pig Competition, £25	969	19 3
11. VETERINARY INSPECTION	70	0 0
12. CONCERT and Church Service for Attendants	21	0 0
13. SHOW TREASURER	2	1 0
14. POSTAGES	50	0 0
15. POST OFFICE and Telephones	143	0 0
16. AMBULANCE	145	4 1
17. MISCELLANEOUS	16	17 0
	136	13 3
	£13,240	19 9
18. PREMIUMS drawn at 30th November 1929	3,740	12 6
	£16,981	12 3
CREDIT BALANCE	17	10 10
	£16,999	3 1

J. E. KERR, *Chairman.*F. J. CARRUTHERS, *Hon. Secretary.*GEO. JAMES GREGOR, C.A., *Auditor.*

ABSTRACT of the ACCOUNTS of the

CHARGE.

I. FUNDS as at 30th November 1928—

£3,193 London and North-Eastern Railway Company 3 per cent Debenture Stock	£2,650 0 0
£5,551, 16s. 3d. 3½ per cent Conversion Loan	4,216 18 2
£500 Queensland 3½ per cent Inscribed Stock, 1950-70	450 1 0
£412 London Midland and Scottish Railway Company 4 per cent Debenture Stock	611 10 6
£190 London Midland and Scottish Railway Company 4 per cent Guaranteed Stock	259 1 11
	£8,187 11 7
BALANCE on Account Current with Royal Bank of Scotland	227 9 9
	<hr/> £8,415 1 4

II. INTEREST ON INVESTMENTS—

On £3193 London and North-Eastern Railway Company 3 per cent Debenture Stock, for year to 30th June 1929	£95 15 10
Less tax	19 3 2
	<hr/> £76 12 8
On £5551, 16s. 3d. 3½ per cent Conversion Loan, for year to 1st October 1929	£194 6 2
Less tax	38 17 2
	<hr/> 155 9 0
On £500 Queensland 3½ per cent Inscribed Stock, 1950-70, for year to 30th June 1929	17 10 0
On £412 London Midland and Scottish Rail- way Company 4 per cent Debenture Stock, for year to 30th June 1929	£16 9 6
Less tax	3 6 0
	<hr/> 13 3 6
On £190 London Midland and Scottish Rail- way Company 4 per cent Guaranteed Stock, for year to 30th June 1929	£7 12 0
Less tax	1 10 4
	<hr/> 6 1 8
	<hr/> 268 16 10
III INCOME-TAX repaid for year to 5th April 1929	62 16 8
SUM OF CHARGE	<hr/> £8,746 14 10

ARGYLL NAVAL FUND for the Year 1928-1929.**DISCHARGE.****I. ALLOWANCES to the following eight Recipients—**

R. A. Forbes (tenth year)	£40 0 0
J. H. Forbes (eighth year)	40 0 0
J. H. Dundas (seventh year)	40 0 0
C. D. Bonham-Carter (seventh year)	40 0 0
W. J. R. Campbell (sixth year)	40 0 0
M. W. G. Webster (fourth year)	40 0 0
C. E. Keys (fourth year)	40 0 0
H. C. D. MacLean (third year)	40 0 0
	<hr/>
	£320 0 0

II. FUNDS at 30th November 1929—

£3193 London and North-Eastern Railway Company 3 per cent Debenture Stock .	£2,650 0 0
£5551, 16s. 3d. 3½ per cent Conversion Loan .	4,216 18 2
£500 Queensland 3½ per cent Inscribed Stock, 1950-70	450 1 0
£412 London Midland and Scottish Railway Company 4 per cent Debenture Stock .	611 10 6
£190 London Midland and Scottish Railway Company 4 per cent Guaranteed Stock .	259 1 11
	£8,187 11 7

Note.—The above Funds are entered at cost price. The market value at 30th November 1929 was £8726, 5s. 1d.

Balance on Account Current with Royal Bank of Scotland	239 3 3	
	<hr/>	8,426 14 10
SUM OF DISCHARGE		£8,746 14 10

J. E. KERR, *Chairman.*

F. J. CARRUTHERS, *Hon. Secretary.*

GEO. JAMES GREGOR, C.A., *Auditor.*

VIEW OF RECEIPTS AND PAYMENTS

For the Year 1928-1929.

RECEIPTS.

1. ANNUAL SUBSCRIPTIONS AND ARREARS received	£2,489	6	6
2. LIFE SUBSCRIPTIONS	789	12	0
3. INTERESTS AND DIVIDENDS—			
Interests	£4,028	0	10
Dividends	1,393	10	10
			5,421 11 8
4. 'TRANSACTIONS'—Sales and Advertisements			16 16 11
5. INCOME-TAX repaid for year to 5th April 1929			1,110 8 3
6. RECEIPTS from Edinburgh Show, 1927			4 0 0
7. RECEIPTS from Aberdeen Show, 1928			229 8 0
8. RECEIPTS from Alloa Show, 1929			16,999 3 1
9. QUARANTINE STATION			21 7 5
10. MISCELLANEOUS			1 16 6
	£27,083	5	4

PAYMENTS.

1. ESTABLISHMENT EXPENSES—			
Salaries and Wages and Allowance for Cleaning	£2,461	15	0
Retiring Allowances	252	0	0
Fen-duty, Taxes, Coal, Gas and Electric			
Light, Insurance, Repairs and Furnishings	484	0	0
	£3,197	15	0
2. FEE TO AUDITOR of Accounts, 1927-1928			75 0 0
3. EDUCATION—N.D.A. Examinations			75 5 2
4. CHEMICAL DEPARTMENT			437 13 10
5. VETERINARY DEPARTMENT			20 7 0
6. DAIRY DEPARTMENT			282 1 11
7. SOCIETY'S 'TRANSACTIONS'			1,710 9 0
8. ORDINARY Printing, Advertising, Stationery,			
Books, and Postages	595	5	10
9. SALARY to Consulting Engineer	250	0	0
10. MISCELLANEOUS Payments	221	15	6
11. PAYMENTS on account of Aberdeen Show, 1928	272	1	0
12. PAYMENTS on account of Alloa Show, 1929			
1. Premiums and Medals	£3,757	12	6
2. Expenses	13,240	19	9
			16,998 12 3
13. PREMIUMS AND MEDALS for Local Shows and Dis-			
trict Competitions	581	10	9
14. CERTIFICATES AND MEDALS for Long Service	110	10	2
15. EXPENSES in connection with Visiting Sites for			
future Shows and attending Meetings	29	6	2
16. SPECIAL LOSSES incurred	141	19	6
17. SPECIAL GRANTS	440	0	0
			25,439 13 1
BALANCE OF RECEIPTS	£1,643	12	3

J. E. KERR, *Chairman.*
F. J. CARRUTHERS, *Hon. Secretary.*
GEO. JAMES GREGOR, C.A., *Auditor.*

EDINBURGH, 8th January 1930

PROCEEDINGS AT BOARD MEETINGS.

MEETING OF DIRECTORS, 3RD APRIL 1929.

Mr JAMES M'LAREN, Cornton, Bridge of Allan, in the Chair.

Present.—*Vice-President*—Mr J Ernest Kerr. *Ordinary Directors*—Mr Norman H. Constable; Hon. T. G. P. Corbett; Mr James Durno; Mr W. P. Gilmour; Mr George Grant; Mr William C. Hunter; Mr James R. Lumsden; Mr James M'Clean; Mr James M'Queen; Mr William Meiklem; Mr Alexander Murdoch; Dr T. G. Nasmyth; Mr Robert Park; Brig.-Gen. Archibald Stirling; Mr Thomas Templeton; Mr Phipps O. Turnbull; Mr Archibald Whyte. *Extraordinary Directors*—Mr A. Y. Allan; Mr William Carriek; Mr W. Betts Donaldson; The Earl of Elgin and Kincardine, C.M.G.; Mr John Elliot; Mr James Gray; Mr Robert M'Gee; Mr Peter M'Intyre; Mr Robert Macmillan; Bailie William Poole; Mr A. A. Hagart Speirs. *Hon. Secretary*—Colonel F. J. Carruthers. *Consulting Engineer*—Professor R. Stanfield.

The late Mr Alexander Robertson, Polmaise.

Before proceeding with the business of the Meeting, the Chairman referred in sympathetic terms to the death of Mr Alexander Robertson, Polmaise. Mr Robertson, he said, was long connected with the Society, and acted as an Ordinary Director for a term of four years, and as an Extraordinary Director on several occasions. He was well known throughout Agricultural circles, especially on account of his knowledge of Shorthorn Cattle, and his services as a Judge were in demand at many leading Shows. He took a prominent part in local administrative affairs, and devoted much time and energy to the public service. With a quiet and unassuming manner he combined, to a remarkable extent, those qualities of sincerity and efficiency which earned him the respect and regard of a wide circle of friends and business associates.

A resolution of regret and sympathy was submitted and approved, the members present upstanding, and the Secretary was instructed to forward a copy to the widow of the deceased.

Letters.

The following letter was submitted:—

Mrs Elliot, Lanark.—Expressing thanks for resolution of sympathy on the death of her husband, the late Mr William Elliot, Lanark.

Vacancy on Board.

On the Motion of Colonel F. J. Carruthers of Dormont, Lockerbie, it was unanimously agreed to recommend to the General Meeting in June that Mr J. Bryce Duncan, Newlands, Dumfries, be appointed an Ordinary Director for the Dumfries Show Division, to fill the vacancy caused by the appointment of Colonel Carruthers to the office of Honorary Secretary of the Society.

Aloa Show, 1929.

Attending Members.—The following Directors were appointed as Attending Members: *Shorthorn*—The Earl of Elgin and Kincardine, C.M.G., and J. P. Ross Taylor; *Aberdeen Angus*—W. Betts Donaldson and A. Y. Allan; *Galloway*—James M'Queen; *Belted Galloway*—Colonel Robert W. Walker; *Highland*—Archibald Whyte; *Ayrshire*—William Low and John W. Prentice; *British Friesian*—Hon. T. G. P. Corbett and Peter M'Intyre; *Red Poll*—William C. Hunter; *Clydesdale Stallions and Colts*—James M'Clean and William Carrick; *Clydesdale Geldings and Draught Geldings in Harness*—William M'Laren; *Clydesdale Mares and Fillies*—A. A. Hagart Speirs and Robert M'Gee; *Shires*—William Meiklem; *Hunters and Riding Ponies*—Colonel F. J. Carruthers and Major Robert W. Sharpe; *Highland Ponies*—Alexander Munro; *Western Island Ponies*—Brigadier-General Archibald Stirling; *Shetland Ponies*—James Gray; *Harness Classes*—Robert Park; *Blackface Sheep*—John Elliot and Thomas Templeton; *Cheviot*—P. O. Turnbull; *Border Leicester*—John Robson, Jun.; *Half-Bred and Fat Sheep*—Dr Thomas G. Nasmyth; *Oxford-Down*—Alexander Niven; *Suffolk*—Baillie William Poole, J.P.; *Shropshire and Dorset Horn*—Alfred H. Reid; *Goats*—The Master of Polwarth; *Large White Pigs*—W. Watson Murray; *Middle White*—Peter Grant; *Large Black*—Provost A. P. Moir; *Large White Ulster*—William S. Niven; *Poultry*—Dr J. F. Tocher; *Honey*—Athole S. Hay; *Dairy Produce*—Sir Thomas Paxton, Bart., LL.D.; *Wool*—Lieut.-Colonel Thomas W. Cuthbert, C.M.G., D.S.O.

Local Committee.—The Secretary reported that at a Meeting of Local Directors, held at Stirling on 21st March, additional members of the Local Committee of Management from the Show Division had been appointed.

Stewards.—On the recommendation of the Catering Committee, it was unanimously agreed that Major Robert W. Sharpe of the Park, Earleton, be appointed Steward of Catering, in place of the late Mr William Elliot.

It was further agreed that the Master of Polwarth be appointed Assistant Steward of Stands, in place of Major Sharpe.

Parade Ground, &c.—A Minute of Meeting of Shows Committee, dated 3rd April, was read and approved.

The Committee recommended that the Standing Gallery, facing the Grand Stand, be extended along both ends of the Parade Ground, the present part to be charged for as formerly, and the ends to be free to the public.

Catering.—A Minute of Meeting of Catering Committee, dated 3rd April, was submitted and approved.

The Minute recommended that there be four licensed catering Stands in the Showyard, these to be in the hands of the following caterers: Royal Athenaeum, Aberdeen; Messrs Alexander Fairley & Sons, 83 Leith Street, Edinburgh; Messrs William & R. S. Kerr (Glasgow), Ltd., 272 St Vincent Street, Glasgow; and Messrs M. Mitchell & Co., Ltd., 2 Gloucester Place, Edinburgh. The Tea Stand would again be in the hands of Mr John Henderson, Aberdeen. The British Women's Temperance Association would, as usual, have an unlicensed refreshment Stand. In the licensed Stands a buffet to be provided for light refreshments, an additional width of 20 feet being allowed in the front part of each Stand for this purpose.

Royal Dundee Institution for the Blind.—On an application from the Institution, it was agreed to grant a free Stand, 20 feet in Section 6, for the exhibition of work by the blind.

Dumfries Show, 1930.

A Report by the Sites Committee, appointed by the Directors on 9th January, was submitted and approved.

The Report stated that the Committee had visited Dumfries on 19th March, and inspected two available sites for the Show of 1930. The first of these was at Rotchell Park, on ground belonging to Messrs R. A. & W. Johnston, Whitesands, Dumfries. This site comprised three fields of old pasture, extending to about 48 acres, on part of which the Show was held in 1922. The area was rectangular in shape, with a good level surface. Eight acres or thereby could conveniently be fenced off for a Motor Enclosure, leaving 40 acres available for the Show. The rent the Society would require to pay for the use of the ground was £400. Gas and water were both available on the ground, and the Town Council of Dumfries had offered a free supply of water, gas, and electric power, together with an increased donation of £100 towards the expenses of the Show.

As an alternative site the Directors of the Crichton Royal Institution had

kindly offered the use of several fields on the Crichton Royal Farm. These were found to be ample in extent, although in other respects not quite so suitable or convenient as the site first mentioned.

The Committee were unanimously of the opinion that the site at Rotchell Park was eminently suitable and convenient, and they recommended its acceptance, on the terms mentioned, as a site for the Show of 1930.

Hundredth Show, 1931.

The following letter, dated 26th March, from Provost A. M. MacEwen, Inverness, was read:—

TOWN HOUSE, INVERNESS,
26th March 1929.

JOHN STIRTON, Esq., Secretary,
Highland and Agricultural Society,
Edinburgh.

DEAR SIR,

Hundredth Show.

I duly received your letter enclosing copy of letter addressed to you by Messrs Tods, Murray & Jamieson. I observe that, at the last Meeting of Directors, no discussion was allowed on this subject, and apparently the Chairman ruled that, in view of the advice given by the Society's Law Agents, the matter was settled, and that it was incompetent to discuss it further.

I have submitted the correspondence to the Committee which was appointed to further the interests of Inverness and the Highlands in connection with the Hundredth Show. I am desired by the Committee to point out that there is widespread dissatisfaction expressed, not only in the Highlands, but by many members of the Society in all parts of the country, at the manner in which this alleged decision has been arrived at. While we would, of course, be very disappointed if the Show were not to come to Inverness, we would loyally accept the decision if we felt that it had been arrived at in a constitutional manner, and expressed the considered judgment of the Directors. No one can say that this is the case. We are unwilling to protract the discussion further, but we have to suggest that, in fairness to all concerned, an endeavour should be made by the Directors to remove the feeling of bitterness which undoubtedly exists in many quarters at the proceedings which have taken place. With the view of this, we have therefore to suggest that the questions raised in the Memorial which we submitted to Mr Normand, K.C., should, along with his Opinion, and the Opinion of Messrs Tods, Murray & Jamieson, be submitted to an independent Counsel for his advice, and that the Directors should undertake to be bound by his Opinion. If the Directors would agree to this course we, on our part, will undertake that, whatever the decision may be, we will not only loyally abide by it, but we will do all in our power to remove any feelings of dissatisfaction which may exist, and do what we can to contribute to make the Hundredth Show an unqualified success.

I shall be obliged if you will submit this letter to the next meeting of the Board.
Yours faithfully,

ALEX. M. MACEWEN, Provost.

The Chairman said that a copy of that letter had been handed to the Society's Law Agents, who had written a letter containing their observations thereon. He desired to point out that Provost MacEwen, in the first paragraph of his letter, stated that, at the Meeting of Directors, no discussion was allowed on this subject. That was not the case. He did not allow a Motion to be moved, but he allowed a discussion.

The following letter from Messrs Tods, Murray & Jamieson, W.S., was then read:—

JOHN STIRTON, Esq.,
Highland and Agricultural Society of Scotland,
8 George IV. Bridge, Edinburgh.

66 QUEEN STREET, EDINBURGH,
1st April 1929.

DEAR SIR,

Hundredth Show.

We refer to our meeting with you at the end of last week when you handed us copy letter which you have received, dated 26th ulto., from Provost MacEwen.

We are sure that it is a matter of great regret to the Directors that any of the members of the Society in the North should still be dissatisfied with the decision

that the Hundredth Show be held in Edinburgh. It is not difficult to understand the natural disappointment felt by Inverness that the Show should not be held there. In point of fact, the Directors at one time by a majority decided that the Show should be held in Inverness, subject to submission of the question to the Society. It cannot, therefore, be said that the Directors have in any way been unfriendly to the claims of Inverness.

Subsequently, however, to that decision of the Directors, the Society by a majority decided that the Show be held in Edinburgh, and, if we understand Provost MacEwen's letter aright, it is now suggested that the Directors should reverse the decision of the Society. We have already advised that it is not within the power of the Directors to reverse the decision of the Society, but if it were in the power of the Directors to do so, it occurs to us that if the Directors did so, so far from diminishing any feelings of disappointment there may be at present, these feelings of disappointment would be increased. A majority of the members of the Society have decided in favour of the Show being held in Edinburgh, and for the Directors, in knowledge of that fact, to decide that the Show be held elsewhere would, in our view, certainly cause resentment amongst the supporters of Edinburgh, and would, we think, with equal certainty cause resentment amongst many members of the Society, who, though not holding strong views as to where the Show should be held, would undoubtedly object to the Directors taking it upon themselves to reverse the decision of the Society given in General Meeting.

Provost MacEwen suggests that the Directors should agree to submit the question to an independent Counsel for his advice on the footing that the Directors would undertake to be bound by his opinion. We understand Provost MacEwen to mean that if such independent Counsel should take the view that the Directors were not bound by the decision of the Society, the Directors should thereupon reverse the Society's decision, and decide that the Hundredth Show be held in Inverness. We are of opinion that (though we have little doubt as to what the opinion of independent Counsel would be on submission to him of a correct statement of the facts) the Directors would be acting *ultra vires* in coming under any such obligation as Provost MacEwen suggests.

We are, Yours faithfully,

TODS, MURRAY & JAM ESON.

Mr Alexander Murdoch moved that the Secretary be instructed to acknowledge receipt of the letter, express regret that there should be any dissatisfaction in the North, but at the same time state that they could not now reopen the question.

Mr William C. Hunter, in seconding, said that any action such as was suggested would be unconstitutional. In the first place, it would be in direct opposition to the resolution of the members at the General Meeting, and, in the second place, if they agreed to act on the opinion of any Counsel, however eminent, they would be failing to discharge their duty as Directors.

The Motion was unanimously agreed to, and the Secretary was instructed to reply to Provost MacEwen in the terms indicated.

Aberdeen Show—New Implements.

It was reported that the Judges of New Implements had decided to award the Society's Silver Medal to Messrs William Henderson & Sons, Catrine, Ayrshire, for their "Maybet" Two-Speed Winch (fitted to a "Fordson" Tractor) and Endeavour (2) Mole Drain Plough. This decision was arrived at after inspecting the Implement at work on Bavelaw Farm, Balerno.

New Premises.

A Minute of Meeting of the Special Committee, dated 2nd April, was submitted and approved.

The Minute recommended acceptance of Estimates for Painter Work at a sum of £245, and Electric Lighting equipment at £200, 8s. 4d.

The Chairman gave notice, in terms of the Standing Orders, that, at next Meeting of the Board, he would submit the following Motion:—

"That the decision arrived at by the Board of Directors on 5th December 1928, that a lift be not installed at the Society's new premises at 8 Eglinton Crescent, be rescinded."

MEETING OF DIRECTORS, 1st MAY 1929.

Mr JAMES M'LAREN, Cornnton, Bridge of Allan, in the Chair.

Present.—Ordinary Directors—Mr Norman H. Constable; Mr William C. Hunter; Mr James R. Lumsden; Mr James M'Laren; Mr James M'Queen; Mr Alexander Niven; Sir Thomas Paxton, Bart., LL.D.; Hon. Walter T. H. Scott, Master of Polwarth; Mr J. P. Ross Taylor. *Extraordinary Directors*—Mr John Elliot; Mr Alexander Forbes; Mr Robert M'Gee; Mr Peter M'Intyre; Mr Robert Macmillan; Bailie William Poole; Mr A. A. Hagart Speirs. *Treasurer*—Sir David Wilson, Bart., D.Sc. *Hon. Secretary*—Colonel F. J. Carruthers. *Consulting Engineer*—Professor R. Stanfield.

The late Viscount Younger of Leckie.

Before proceeding with the business of the Meeting, the Chairman referred in sympathetic terms to the sudden death of Viscount Younger of Leckie, a Vice-President of the Society. Viscount Younger, he said, had been a member of the Society for the long period of fifty years, and it was particularly appropriate that he should have occupied the office of Vice-President that year when the Show was to be held in his native town of Alloa. During a long and active life, Viscount Younger devoted great energy and ability to the public service, and attained to high and responsible positions, both in local administrative affairs and in the wider field of politics and political organisation. He earned and retained the respect and esteem of all with whom he was associated, both in business and in politics. In his death they mourned the loss of a distinguished Scotsman who rendered valuable and devoted service to his country.

A resolution of regret and sympathy was adopted, the members present up- standing, and the Secretary was instructed to forward a copy thereof to the relatives of the deceased.

Letters.

The following letters were submitted:—

Mrs Robertson, Stirling.—Expressing thanks for resolution of sympathy on the death of her husband, the late Mr Alexander Robertson, Polmaise.

J. Bryce Duncan, Newlands, Dumfries.—Agreeing to accept office as an Ordinary Director of the Society.

Alloa Show, 1929.

Local Committee.—The Secretary reported that, at a Meeting of Committee held at Stirling on 25th April, additional Attending Members had been appointed for the various classes of Stock.

Animal Diseases Research Association;

On the recommendation of the Finance Committee, it was agreed that a grant of £200 be again given to the Animal Diseases Research Association for the current year. It was, however, decided to notify the Association that this grant would not be continued for an indefinite number of years.

St Kilda Fund.

A letter was submitted from Mr John MacLeod, Missionary, St Kilda, making application, on behalf of the Islanders, for a supply of Flour and Oatmeal similar to that which had been sent for several years past. The Secretary explained that this letter had been considered by the Finance Committee, which recommended that a supply of 20 bolls of Oatmeal and 50 bolls of Flour be forwarded by the s.s. *Dunara Castle*, on its first sailing in June. The approximate cost was £90, and it was proposed to place the order with Messrs Robert Walls & Sons, Kerse Mills, Stirling.

On the Motion of Sir David Wilson, Bart., Convener the recommendation of the Finance Committee was agreed to.

THE SECRETARY,
The Highland and Agricultural Society of Scotland,
8 George IV. Bridge, Edinburgh.

At the request of the Chairman, the Secretary's letter of 4th April to Lieut.-Colonel Cuthbert, to which reference is made in foregoing letter, was also read.

Mr James M'Queen paid a tribute to the sterling qualities of Lieut.-Colonel Cuthbert.

It was thereupon moved by Bailie William Poole, seconded by Colonel F. J. Carruthers, and unanimously agreed to, that the Secretary write to Lieut.-Colonel Cuthbert, on behalf of the Board, inviting him to reconsider his decision and to continue as a Director of the Society.

Sheep Scab.

Communications were submitted from the Royal Agricultural Society of England and the Ministry of Agriculture and Fisheries with regard to the subject of Sheep Scab. These communications, of which copies had been circulated to the Members of the Board, dealt at length with the measures which had been adopted for the control and eradication of Sheep Scab, and expressed the hope that Local Authorities would make a renewed effort to secure an effective application of the Regulations, and that Agricultural Associations would use their influence to obtain the necessary co-operation of Agriculturists.

After a statement by Mr John Elliot, it was moved by Colonel F. J. Carruthers, seconded by Mr James M'Queen, and agreed to, that a Committee be appointed to consider the matter, and, if necessary, act in conference with other bodies in an endeavour to secure uniformity of action throughout Scotland. The Committee appointed was as follows: Mr James M'Laren, Mr John Elliot, Mr Peter M'Intyre, Mr Robert Macmillan, Mr James M'Queen, and Mr J. P. Ross Taylor.

New Premises.

Mr James M'Laren, Chairman of Directors, submitted the following Motion, of which notice was given at last Meeting, and a copy of which appeared on the Agenda, signed, in terms of Rule 38 of the Standing Orders, by the Mover and ten other Directors:—

"That the decision arrived at by the Board of Directors on 5th December 1928, that a lift be not installed at the Society's new premises at 8 Eglinton Crescent, be rescinded."

Colonel F. J. Carruthers seconded, and the Motion was duly carried.

The Chairman then moved that it be remitted to the Special Committee to arrange for the installation of a lift, and after a full discussion of the subject, the Motion was agreed to.

MEETING OF DIRECTORS, 5TH JUNE 1920.

Mr JAMES M'LAREN, Cornton, Bridge of Allan, in the Chair.

Present.—*Vice-President*—Mr J. E. Kerr of Harviestoun. *Ordinary Directors*—Mr Norman H. Constable; Mr James Durno; Mr W. P. Gilmour; Mr George Grant; Mr William C. Hunter; Mr James R. Lumsden; Mr James M'Clean; Mr James M'Laren; Mr James M'Queen; Mr Alexander Murdoch; Mr John W. Prentice; Mr Alfred H. Reid; Hon. Walter T. H. Scott; Brig-General Archibald Stirling; Mr J. P. Ross Taylor; Mr Archibald Whyte. *Extraordinary Directors*—Mr A. Y. Allan; Mr William Carrick; The Earl of Elgin and Kincardine, C.M.G.; Mr John Elliot; Mr Alexander Forbes; Mr James Gray; Mr William Low; Mr Robert M'Gee; Mr Peter M'Intyre; Mr Robert Macmillan; Mr William S. Niven; Bailie William Poole; Major R. W. Sharpe. *Treasurer*—Sir David Wilson, Bart., D.Sc. *Hon. Secretary*—Colonel F. J. Carruthers. *Chemist*—Dr J. F. Tocher. *Consulting Engineer*—Professor R. Stanfield.

The late Earl of Rosebery, K.G., K.T.

Before proceeding with the business of the Meeting, the Chairman referred in sympathetic terms to the severe loss the Society and the country had suffered through the death of the Earl of Rosebery. Lord Rosebery, he said, was long connected with the Society, having been a member for over sixty years. He occupied the office of Vice-President on several occasions, and for five years, from 1915 to 1919, he was President of the Society. As a breeder and regular exhibitor of various classes of pedigree Live Stock, his name was known throughout the Agricultural world. His services to Agriculture were universally recognised, and as an extensive landowner he was held in the highest esteem. His brilliant intellectual and literary gifts were freely placed at the service of his country, and, while they mourned his loss as the passing of a great Scotsman, they also felt that through his death the nation had lost one of its most distinguished sons. The Society was honoured by his occupancy of the office of President, and his death was a loss to the Society which they deeply deplored.

A Minute of regret and sympathy was submitted and adopted, the members present upstanding, and the Secretary was instructed to forward a copy to the family of the deceased.

The late Sir Archibald Buchan-Hepburn of Smeaton, Bart.

The Chairman also referred with deep regret to the death of Sir Archibald Buchan-Hepburn of Smeaton, Bart. Sir Archibald's services to the Society, he said, would be well remembered by many members of that Board, on which, at one time, he was an outstanding figure. He was a Director continuously from 1899 to 1917, and a Vice-President in 1918 and 1919. During the years 1912 and 1913 he was Chairman of the Board, and, in that capacity, and throughout his long period of office, rendered valuable services to the Society. He took a keen interest in Agricultural and Horticultural affairs, and as a representative of East Lothian on many public bodies, gave unsparingly of his time and ability to the service of the community.

A resolution of regret and sympathy was adopted, the members present upstanding, and the Secretary was instructed to forward a copy thereof to the family of the deceased.

Letters.

The following letters were submitted :—

Viscount Younger of Leckie.—Expressing thanks for resolution of sympathy on the death of his father, the late Viscount Younger.

Department of Agriculture for Scotland.—Forwarding copies of a Memorandum, prepared by the Department, on the Fertilisers and Feeding Stuffs Act, 1926.

Alloa Show, 1929.

St Dunstan's.—It was unanimously agreed to grant a free stand, 20 feet frontage, to St Dunstan's, for an exhibition of the work of blinded ex-service men.

Scottish Flying Club.—It was also agreed to grant a free space in the Showyard for the accommodation of an aeroplane, it being understood that the engine would not be run in the ground, and should a demonstration flight be made, it would take place at such a height and position that no noise would be heard in the Show-ground.

General Arrangements.—The Secretary reported that the work on the Showyard was well forward, most of the principal buildings being already completed. The Showyard looked extremely well. The amount of space let for the exhibition of implements, &c., was in excess of last year, and stock entries, which closed that day, also promised to exceed the previous year. No section of Live Stock had required to be cancelled through the operation of Rule 12.

Animal Diseases Research Association.

On the Motion of Sir David Wilson, Bart., it was agreed to confirm the recommendation adopted at last Meeting, that a grant of £200 be given for the current year to the Animal Diseases Research Association.

'Transactions.'

A Minute of Meeting of Publications Committee, dated 5th June, was read and approved.

The Minute recommended payments to writers of articles in the current volume of 'Transactions,' amounting to £169, 18s.

Resignation of Director.

The Secretary reported that, as instructed at the previous Meeting he had written to Lieut.-Colonel T. W. Cuthbert, on behalf of the Directors, inviting him to reconsider his decision to resign from the Board. Lieut.-Colonel Cuthbert's letter in reply was read, in which he expressed grateful appreciation of the way the Directors had received his letter of resignation, and much regretted his inability to reconsider his decision.

Lieut.-Colonel Cuthbert's resignation was accordingly accepted.

Dunblane Agricultural Society.

The Secretary submitted a lengthy correspondence which had passed between the Society and the Dunblane Agricultural Society. He explained that the latter Society, being within the district of the Alloa Show, had decided not to hold a Show that year. The Strathearn Agricultural Society, which was also within the same district, had decided to hold a Show; and in view of that decision he had notified them that the grant which they were at present in receipt of would be entirely cancelled. The Secretary of the Dunblane Agricultural Society now stated that the Strathearn Society proposed to hold their Show on the date on which the Dunblane Society's Show was usually held—the Glasgow Fair Saturday. The Dunblane Society were afraid that by this action they might lose their claim to that date in the future, and they asked the good offices of the Highland Society to prevent the Strathearn Society from taking their date. After some discussion it was agreed to take no action, as the matter appeared to be one for the two Societies themselves to deal with.

Sheep Scab.

A Minute of Meeting of Special Committee on Sheep Scab, dated 5th June, was submitted and approved.

The Minute recommended that the following representatives of the Society be appointed to act in conjunction with other bodies in connection with this matter: Mr James M'Laren, Mr John Elliot, Mr James M'Queen, Mr Robert Macmillan, and Mr James R. Lumsden.

Electricity Supply in Rural Areas.

The Secretary said that immediately after the last Meeting of the Board, an invitation had been received from the Department of Agriculture for Scotland to send representatives to a conference on Electricity supply in rural areas. The conference was held on 10th May, and the Society was represented thereat by Mr James M'Laren, Mr William C. Hunter, Mr Alexander Murdoch, Mr J. P. Ross Taylor, Mr P. O. Turnbull, and the Secretary. A full note of the proceedings at the conference was submitted.

Finance.

A Minute of Meeting of Finance Committee, dated 5th June, was submitted and approved.

The Minute dealt with the following matters:—

St Kilda Fund.—The Secretary reported that, as arranged at last Meeting, the consignment of Flour and Oatmeal for St Kilda would be despatched per the s.s. *Dunara Castle* on 13th June. The total cost, including freight, insurance, &c., was £78, 19s. 4d.

The Scottish National Milk and Health Association.—It was recommended that a grant of £50 be again given to the Association for the current year, but that it be intimated to the Association that it was improbable that the grant would be continued in the future.

Officer and Caretaker.—The Committee recommended the appointment, as officer and caretaker to the Society, of Mr James P. Lauder, Jessamine Cottage, Tynninghame, Prestonkirk, at a salary of £150 per annum, with cleaning allowance of £1 per week, and free house, coal, and light.

Consulting Engineer.—It was agreed that Professor R. Stanfield's fee as Consulting Engineer to the Society be increased from £150 to £250 per annum—this increase to take effect for the current year.

Highland Reel and Strathspey Society.—The Committee had considered an application from the Highland Reel and Strathspey Society for a grant towards the expenses which they were now compelled to incur in securing accommodation for their weekly meetings, these meetings having, for the past forty-seven years, been held in the Society's Hall. It was recommended that a grant of £30 be given for the current year.

MEETING OF DEPUTATION OF DIRECTORS HELD IN
SHOWYARD, ALLOA, 24TH JULY 1929.

Mr JAMES M'LAREN, Cornton, Bridge of Allan, in the Chair.

Present.—*Vice-President*—Mr J. E. Kerr of Harviestoun. *Ordinary Directors*—Mr N. H. Constable; The Hon. T. G. P. Corbett; Mr James Durno; Mr W. P. Gilmour; Mr George Grant; Mr William C. Hunter; Mr James R. Lumsden; Mr James M'Cloan; Mr James M'Laren; Mr Alexander Munro; Mr Alexander Murdoch; Dr T. G. Nasmyth; Mr John W. Prentice; Mr Alfred H. Reid; Mr John Robson, Jun.; The Hon. Walter T. H. Scott; Brig.-Gen. Archibald Stirling; Mr J. P. Ross Taylor; Mr Phipps O. Turnbull; Mr Archibald Whyte. *Extraordinary Directors*—Mr A. Y. Allan; The Earl of Elgin and Kincardine, C.M.G.; Mr John Elliot; Mr James Gray; Mr Robert M'Gee; Mr Robert Macmillan; Provost A. P. Moir; Mr William S. Niven; Mr A. A. Hagart Speirs. *Treasurer*—Sir David Wilson, Bart., D.Sc. *Honorary Secretary*—Colonel F. J. Carruthers. *Chemist*—Dr J. F. Tocher. *Consulting Engineer*—Professor R. Stanfield. *Consulting Entomologist*—Dr R. Stewart MacDougall.

Protests.

The Secretary reported that no protests had been lodged.

Precepts.

The Chairman was authorised to sign the Precepts for the prizes awarded at the Alloa Show.

Damage by Warble Fly.

Letters were submitted from the Leathersellers' Company with regard to the formation of a Committee to inquire into the ravages caused by Warble Fly and as to what steps should be taken to mitigate the evil. They invited the Society to nominate a representative to act on the Committee.

Colonel F. J. Carruthers reported that he had had a meeting with the Secretary of the Leathersellers' Company, and had discussed with him the general lines of the suggested inquiry. It was unanimously agreed that Colonel Carruthers be appointed as the Society's representative on the proposed Committee.

Refund of Stand Rent.

The Secretary was authorised to refund to Messrs David Ross & Sons, Forbes, a sum of £6, 10s., being half the rent paid by them for space at the Show. They explained in a letter that, through the death of their senior partner, they were unable to exhibit.

Empire Farmers' Tour to New Zealand.

Letters were submitted from the Secretary of the British National Union giving particulars of a proposed Empire Farmers' tour to New Zealand to start in January 1930.

MEETING OF DIRECTORS, 6TH NOVEMBER 1929.

Mr JAMES M'LAREN, Cornton, Bridge of Allan, and afterwards
Mr J. ERNEST KERR of Harviestoun, Dollar, in the Chair.

Present.—Ordinary Directors—Mr James P. Brown; Mr Norman H. Constable; Mr James Durno; Mr Thomas Elder; Mr George Grant; Mr James R. Lumsden; Mr James M'Queen; Mr William Meiklem; Mr Alexander Murdoch; Mr John W. Prentice; Mr John Robson, Jun.; The Hon. Walter T. H. Scott; Major R. W. Sharpe; Mr John P. Sleight; Mr A. A. Hagart Speirs; Mr J. P. Ross Taylor; Mr Archibald Whyte; Mr George Will. *Extraordinary Directors*—Mr John Elliot; Mr W. P. Gilmour; Mr F. N. M. Gourlay; Mr A. Thornton Hunter; Mr William C. Hunter; Mr J. E. Kerr; Mr William Low; Mr James M'Laren; Mr Robert Macmillan; Dr T. G. Nasmyth. *Treasurer*—Sir David Wilson, Bart., D.Sc. *Hon. Secretary*—Colonel F. J. Carruthers. *Consulting Engineer*—Professor R. Stanfield.

The late Mr Peter Grant, Advie Mains.

Before proceeding with the business of the Meeting, the Chairman reformed with very deep regret to the death of Mr Peter Grant, Advie Mains. Mr Grant, he said, had a long connection with the Society, and immediately prior to his death had completed a term of four and a half years as a Director. As proprietor of the Hotel, Carr Bridge, for many years, Mr Grant was known and highly respected by a wide circle of friends. As an enthusiastic and successful breeder of Aberdeen-Angus Cattle, his name was known wherever the breed had penetrated. He devoted much of his time and ability to local administrative affairs.

A Minute of regret and sympathy was submitted and adopted, the members present upstanding, and the Secretary was instructed to forward a copy to the relatives of the deceased.

Chairman of the Board for 1929-1930.

On the Motion of the Chairman, Mr James M'Laren, Cornton, Bridge of Allan, seconded by Colonel F. J. Carruthers of Dormont, Lockerbie, Mr J. Ernest Kerr of Harviestoun, Dollar, was unanimously elected Chairman of the Board for the ensuing year.

Mr J. Ernest Kerr, on taking the Chair, thanked the Directors for the honour they had done him.

On the Motion of Mr Kerr, a cordial vote of thanks was accorded to Mr James M'Laren for his services to the Society as Chairman of the Board of Directors during the past two years.

Mr M'Laren suitably replied, and thanked the Board and Chairman for the expression of appreciation of his services. He also acknowledged the assistance rendered him by the Secretary and the Society's staff during his period of office.

Representatives on other Bodies.

The following were appointed representatives of the Society on the Boards of the undernoted Institutions for the ensuing year—viz.: *National Agricultural and Dairy Examination Boards*—Mr J. E. Kerr of Harviestoun, Dollar, to fill the vacancy caused by the retirement of The Earl of Elgin and Kincardine, C.M.G. *Edinburgh and East of Scotland College of Agriculture*—Mr John Stirton, Secretary, Highland and Agricultural Society. *West of Scotland Agricultural College*—Sir Hugh Shaw Stewart of Greenock and Blackhall, Bart., C.B., Ardgowan, Inverkip. *Aberdeen and North of Scotland College of Agriculture*—Dr J. F. Tocher, 41½ Union Street, Aberdeen. *Royal (Dick) Veterinary College*—Dr Thomas G. Nasmyth, Canaan Lodge, Canaan Lane, Edinburgh. *Glasgow Veterinary College*—Mr Alexander Murdoch, East Hallside, Hallside, Lanarkshire. *Scottish Milk Records Association*—Mr W. P. Gilmour, Balmangan, Kirkcudbright; Mr Alexander Munro of Leanach, Culloden Moor, Inverness; Mr Alexander Murdoch. *Standing Committee of Management of Scottish Plant Registration Station*—Sir David Wilson, Bart.; Mr James Elder, Athelstaneford Mains, Drem; Mr G. Bertram Shields. *Association for the Preservation of Rural Scotland*—The Hon. Walter T. H. Scott, Master of Polwarth, Harden, Hawick. *Scottish Pig Industries Committee*—Mr Alexander Forbes, Rettie, Banff; Mr J. T. M'Laren, The Leuchold, Dalmeny; Mr George Will, Crichton Royal, Dumfries.

Vacancy on Board.

It was remitted to the three Ordinary Directors for the Inverness Show Division to bring forward, at next Meeting, the name of a Director to fill the vacancy caused by the retirement of Lieut.-Col. T. W. Cuthbert, C.M.G., D.S.O.

Letters.

The following letters were submitted:—

The Earl of Rosebery.—Thanks for Minute of sympathy on the death of his father, the late Earl of Rosebery.

Sir John Buchan-Hepburn, Bart.—Thanks for Minute of sympathy on the death of his father, the late Sir Archibald Buchan-Hepburn, Bart.

Animal Diseases Research Association.—Thanks for renewal of grant of £200 for the current year.

Highland Reel and Strathspey Society.—Thanks for grant of £30 for the current year.

Central Council of S.W.R.I.—Thanks for free stand at Alloa Show.

Depredations by Red Deer.

A letter was submitted from the Department of Agriculture for Scotland inviting the Society to appoint representatives to a further conference on the above subject to be held at the Department's offices on 4th December. It was agreed that the following be appointed to represent the Society at the conference: Mr Robert Macmillan, Mr John Elliot, Mr Archibald Whyte, and Mr Peter M'Intyre.

Alloa Show, 1923.

Accounts.—The Secretary reported that a summary of the Accounts of the Alloa Show had that day been submitted to the Finance Committee. These showed a probable loss of about £36.

List of Awards.—The List of Awards at Alloa Show was laid on the table.

Dumfries Show, 1930.

Date of Show.—On a recommendation of the Shows Committee, it was agreed that the date of the Show be fixed for Tuesday, 22nd July, and three following days.

Convener of Local Committee.—On the Motion of Mr James M'Queen, seconded by Mr W. P. Gilmour, Colonel F. J. Carruthers of Dormont, Lockerbie, was unanimously appointed Convener of the Local Committee of Management.

Judges.—The following were appointed a Selection Committee to draw up panels of Judges for consideration at next Meeting: Mr N. H. Constable, Mr James Durno, Mr John Elliot, Mr W. P. Gilmour, Mr F. N. M. Gourlay, Mr George Grant, Mr William C. Hunter, Mr Robert Macmillan, Mr Alexander Murdoch, Mr John Robson, Jun., Mr J. P. Ross Taylor, Mr Thomas Templeton, with the Chairman, Treasurer, and Hon. Secretary, *ex officio*.

Forage Committee.—The following Committee was appointed to make arrangements for the supply of forage, and report to the Board: Mr James Durno (Convener), Mr John Elliot, Mr W. P. Gilmour, Mr James M'Laren, Mr R. Macmillan, Mr Alexander Murdoch, Mr John W. Prentice, Mr Phipps O. Turnbull, and Mr George Will.

Show Contracts.—It was remitted to the following Special Committee, with powers, to arrange the contract for timber, and other contracts in connection with the Showyard: Mr R. Macmillan (Convener), Colonel F. J. Carruthers, Mr James Durno, Mr John Elliot, Mr James R. Lumsden, Mr James M'Laren, Mr W. S. Niven, Mr John P. Sleigh, Brig.-General Archibald Stirling, Colonel Robert W. Walker, Mr Archibald Whyte, Mr George Will, and Professor R. Stanfield.

Hotel Accommodation and Catering in Showyard.—It was remitted to the Chairman of the Board, the Chairman of the Shows Committee, the Convener of the Local Committee, the Steward of Catering, and the Secretary, to make the necessary arrangements.

Police.—It was remitted to the Secretary to make the necessary arrangements for police supervision in the Showyard.

Music.—The Secretary was instructed to make the necessary arrangements for music in the Showyard.

Prize List and Regulations.—The Secretary stated that the Shows Committee had met on 5th November, and had revised the Premium List and Regulations for the Dumfries Show. It was agreed that, as usual, their report be printed and issued for consideration in detail at next Meeting of the Board.

Bacon Pig Competition.—On the Motion of Mr George Will, seconded by Mr Thomas Elder, it was agreed to remit to the Shows Committee to consider and report as to continuing the Bacon Pig Competitions, formerly conducted by the Scottish National Pig Breeders' Association, which body had now been wound up.

Special Prizes.—A large number of Special Prizes were accepted.

The Chairman, in moving a vote of thanks to the donors of these Special Prizes, said he was sure the Directors would wish him to mention specially the handsome Gold Cup offered by Mr William Moiklem, Bennoch Park, Kirkcaldy, for Clydesdale Geldings.

Dr Gillespie Memorial Challenge Trophy.

A letter was read from the Secretary of the Galloway Cattle Society, handing over the Dr Gillespie Memorial Challenge Trophy to the Highland and Agricultural Society for all time, under the condition that the Trophy be offered annually for competition in the Classes for Galloway Cattle at the Society's Shows, and awarded to the best animal registered in the Galloway Cattle Society's Herd-Book, "Extra Stock" being eligible to compete. The Galloway Cattle Society felt it was fitting that this Memorial to one who did so much for Agriculture in general, and Scottish Agriculture in particular, should be in the possession of the premier Scottish Agricultural Society. It was agreed to accept custody of the Trophy, and the Secretary was instructed to convey the cordial thanks of the Board to the Galloway Cattle Society.

Warble Fly.

Colonel F. J. Carruthers of Dormont made a statement with reference to the setting up of a Committee on Warble Fly by the Leathersellers' Company, on which Committee he had been appointed to act as the Society's representative.

After giving some particulars as to the steps already taken by the Committee, he stated that, in his view, the order of procedure should be somewhat as follows: (1) A definite scheme to be evolved to ensure to the feeder a share of the increased value of the skin—he thought it should be a large share; (2) instruction to be made available as to the best means of destroying the pest; (3) encouragement and help to be given in carrying out the treatment; and (4) compulsion—and that only if the general body of farmers agreed it was desirable.

After a discussion, which was taken part in by Mr Thomas Elder, Mr J. P. Ross Taylor, Dr T. G. Nasmyth, and Mr William Meiklem, it was agreed that the matter be left in the hands of Colonel Carruthers.

Quarantine Station for Scotland.

Letters were read from Mr J. Duthie Webster, Tarves, with regard to the desirability of now proceeding with the provision of a Quarantine Station for Scotland. The Secretary explained what steps had already been taken with regard to this matter, and mentioned that an option had been obtained on a piece of ground near Princes Dock, Glasgow, which was considered to be a suitable site. The Society's attitude was, that as soon as there was any demand from the Breed Societies for such a Station, they would be prepared again to take action in the matter.

After some discussion, it was agreed to await representations from the Breed Societies, the Secretary in the meantime to ascertain what Colonies and Dominions were at present receiving stock through the Quarantine Station in London, and the number of animals which had passed through the Station.

Fire Insurance of Woods.

On an invitation from the Royal Scottish Arboricultural Society, it was decided to nominate Brig.-General Archibald Stirling of Keir and the Lord Scone as the Society's representatives at a proposed Conference as to Fire Insurance of Woods.

Hannah Dairy Research Institute.

A letter was submitted from Sir Donald MacAlister, Chairman of the Joint-Committee of Management of the Hannah Dairy Research Institute, making application for a grant of £500 towards the provision of equipment for the Institute's Laboratories and Library, and a grant of £1000 towards an Endowment Fund.

It was agreed that the application be remitted to the Finance Committee for consideration and report.

Electricity Supply in Rural Areas.

A letter was submitted from the Department of Agriculture, asking the Society's views with regard to the findings of the Conference held on 10th May 1929.

It was agreed to remit to the representatives of the Society who were present at the Conference to deal with the matter and report.

Inspection of Growing Crops of Potatoes.

The Secretary reported that a Conference had been held at the Offices of the Department of Agriculture for Scotland on 30th October, with reference to amendments proposed to be made in the Scheme for Inspection and Certification of Growing Crops of Potatoes. The Society was represented at the Conference by Mr P. O. Turnbull, Smeaton, Dalkeith. As a result of the discussion which then took place, it was decided that the matter should be further inquired into by the Department before the suggested Scheme was proceeded with.

11th International Veterinary Congress.

A letter was submitted inviting the Society to appoint delegates to the 11th International Veterinary Congress to be held in London from the 4th to 9th August 1930.

It was unanimously agreed to nominate Dr T. G. Nasmyth and Mr Alexander Murdoch to represent the Society at the Congress.

Education.

Colonel F. J. Carruthers, Convener of the Education Committee, submitted a report on the Examination for the National Diploma in Dairying held at Reading and Kilmarnock in September.

Finance.

A Minute of Meeting of Committee, dated 6th November, was submitted and approved.

The Minute dealt with the following matters:—

Auditor and Show Treasurer.—It was recommended that Mr George J. Gregor's fee as Auditor be increased from £75 to £120, and his fee as Show Treasurer from £50 to £100.

Staff Salaries.—It was agreed to recommend the following increases in the salaries of members of the Staff: J. G. Yardley, Chief Clerk, from £400 to £450; Annie T. Matland, Typist, from £150 to £160.

Hundredth Show, 1931.

The following Committee was reappointed to consider the preliminary arrangements for the Hundredth Show to be held in 1931: Mr James Durno, Mr William C. Hunter, Mr James R. Lumsden, Mr Robert Macmillan, Mr Alexander Munro, Mr Alexander Murdoch, Dr T. G. Nasmyth, Major Robert W. Sharpe, with the Chairman, Treasurer, and Honorary Secretary, *ex off*.

MEETING OF DIRECTORS, 4TH DECEMBER 1929.

Mr J. ERNEST KERR of Harviestoun, Dollar, in the Chair.

Present.—Ordinary Directors—Mr James P. Brown; Mr Norman H. Constable; Mr J. Bryce Duncan; Mr James Durno; Mr Thomas Elder; Mr George Grant; Mr James R. Lumsden; Mr James M'Clean; Mr James M'Queen; Mr Alexander Munro; Mr Alexander Murdoch; Mr Robert Park; Mr John W. Prentice; Mr John Robson, Jun.; The Lord Seone; The Hon. Walter T. H. Scott; Major R. W. Sharpe; Mr John P. Sleight; Mr A. A. Hagart Speirs; Mr J. P. Ross Taylor; Colonel R. W. Walker; Mr Archibald Whyte; Mr George Will. *Extraordinary Directors*—Mr John Elliot; Mr W. P. Gilmour; Mr F. N. M. Gourlay; Mr John Howatson; Mr A. Thornton Hunter; Mr William C. Hunter; Mr J. Ernest Kerr; Mr Murray Little; Mr William Low; Mr Matthew C. Lusk; Mr Robert Macmillan; Mr George A. Marshall; Dr T. G. Nasmyth; Mr Charles W. Ralston. *Hon. Secretary*—Colonel F. J. Carruthers. *Consulting Engineer*—Professor R. Stanfield.

The late Baron Blythswood of Blythswood.

Before proceeding with the business of the Meeting, the Chairman referred in sympathetic terms to the death of Baron Blythswood of Blythswood, who was President of the Society in 1925, the year of the Glasgow Show. All who were Members of the Board at that time, he said, would recall the extraordinary enthusiasm with which Lord Blythswood entered into the duties of his office, and the large amount of time and personal attention he devoted to the business of the Show, and which contributed greatly to its outstanding success. His unflinching courtesy and kindly personality earned the esteem of all with whom he was associated. As a landlord he was held in great respect by his agricultural tenants, and as a man of affairs, connected with numerous public bodies, he was held in the highest regard.

A Minute of regret and sympathy was submitted and adopted, the members present upstanding, and the Secretary was instructed to forward a copy to Lady Blythswood and the daughter of the deceased.

The late Baron Forteviot of Dupplin.

The Chairman also referred in sympathetic terms to the death of Baron Forteviot of Dupplin. Lord Forteviot, he said, had had a long connection with the Society, having been a member since 1894, an Ordinary Director from 1918 to 1921, and an Extraordinary Director on several occasions. As a breeder of various classes of farm live-stock, Lord Forteviot achieved considerable success, and he was a regular exhibitor at the Society's Annual Show. As a landowner he did much to improve rural conditions in his own district. His home farms were object-lessons of high educational value, providing practical demonstrations of scientific methods applied to the practice of agriculture. He rendered valuable public service, not only in local affairs but in the wider sphere of national government, and his generous benefactions to his native city formed a lasting tribute to his memory.

A Minute of regret and sympathy was submitted and adopted, the members present upstanding, and the Secretary was instructed to forward a copy to Lady Forteviot and the family of the deceased.

Vacancy on Board.

On behalf of the Ordinary Directors in the Inverness Show Division, Mr Alexander Munro of Leanach moved, and Mr John Robson, Jun., Lynegar, seconded, that Mr Ian M. Campbell, Tighnamara, Dornoch, be nominated as an Ordinary Director to fill the vacancy caused by the retirement of Lieut.-Col. T. W. Cuthbert, C.M.G., D.S.O.

Dumfries Show, 1930.

A report of the Shows Committee, dated 5th November, which had been printed and circulated, was submitted and considered in detail.

The following matters arising out of the report were dealt with:—

British Friesian Cattle.—It was agreed that the special prizes for Cows from Grade "A" (T.T.) or Certified herds be discontinued.

Blackface Sheep.—In view of the deletion of the class for out-wintered Shearling Tups, it was decided to add a class for Tups above 2 shear, with prize money £12, £8, £4, £2.

The report of the Shows Committee, with the foregoing emendations, was then adopted.

A further Minute of Meeting of Shows Committee, dated 4th December, was submitted and approved.

The Minute dealt with the following matters:—

Dentition of the Pig.—On the report of a Sub-Committee, which had considered the communications received from the National Pig Breeders' Association and the Large Black Pig Society, it was recommended that no action be taken meantime with regard to the introduction of a Dentition Test for Pigs at the Show. It was pointed out that the whole matter of the Dentition of the Pig was under investigation by Principal Bradley of the Royal (Dick) Veterinary College.

Rural Industries.—On the report of a Sub-Committee, it was recommended that the grant of a free stand to the Central Council of the S.W.R.I. be discontinued. It was, however, recommended that a free stand, with 40 feet frontage in Section 6, be granted to the South-Western Area of the S.W.R.I. The Open and Confined Classes in the Rural Industries Section had been adjusted, and would appear in the proof of the Prize List.

Fur-Producing Rabbits.—A revised and extended classification for Fur-Producing Rabbits was recommended, on a report of a Sub-Committee.

Shire Horses.—A suggestion by the Shire Horse Society that a class be provided for Shire Stallions, to which that Society did not propose to contribute any part of the prize money, had been considered, but it was recommended that the suggestion be not adopted. It was, however, proposed that a class for two-year-old Colts be offered, on condition that the Shire Horse Society was prepared to contribute 40 per cent of the prize money, as in the case of the other classes.

Suffolk Horses.—An application from the Suffolk Horse Society for a class for Suffolk Geldings had been considered, but it was recommended that the application be not entertained.

Stock-Judging Competition.—In view of a communication received from Principal Paterson of the West of Scotland Agricultural College, it was recommended that the age limit for competitors be fixed at twenty-three years instead of twenty-one years as previously suggested.

Substitution of Entries.—It was recommended that the period during which one animal could be substituted for another, as provided in Regulation No. 2, be extended from three to four weeks.

Appointment of Judges.—The Secretary reported that at a Meeting of the Board in Committee, on 3rd December, Judges had been appointed for the various classes of stock. These were being communicated with, and after replies were received the List of Judges would be published in the Press.

Special Prizes.—A number of Special Prizes were accepted, and votes of thanks accorded to the donors.

Electricity Supply in Rural Areas.

A Report by the representatives of the Society who attended the Conference held at the offices of the Department of Agriculture on 10th May was submitted and approved.

The Report stated that the Society's representatives had considered the Notes of the Conference, supplied by the Department of Agriculture, and were agreed that these Notes embodied a correct statement of the discussion which took place, and the decisions arrived at, with which the Society's representatives were in agreement. It was decided to recommend that it be represented to the Department of Agriculture that, before definite steps were taken to secure legislation with the object of carrying these findings into effect, a draft of the proposed Bill be circulated to the bodies interested for their observations and criticisms.

Proposed Quarantine Station.

The Secretary stated that, as instructed at last Meeting, he had obtained from the Secretary of the Royal Agricultural Society certain information regarding the London Quarantine Station. All the British Dominions, Colonies, and Dependencies had agreed to accept the Quarantine Scheme, with the exception of Canada and New Zealand. During the first eighteen months of its existence, 836 animals had passed through the Station, of which 508 were Cattle, 203 Sheep, 114 Pigs, and 11 Goats.

On the suggestion of Mr Thomas Elder of Stevenson, it was agreed that the Secretary be asked to ascertain before next Meeting what proportion of these animals came from Scotland.

Grading and Marking of Beef, &c.

A communication was submitted from the Central Chamber of Agriculture, forwarding Resolutions with regard to the grading and marking of Home-killed Beef, and the grading and marking of English Flour, and inviting the Society's support to their propaganda scheme for encouraging the consumption of these commodities.

After some discussion, it was agreed that the Society support the scheme in so far as that was found to be practicable.

Importation of German Oats.

A letter was read from the Secretary of the National Farmers' Union of Scotland, intimating that the deputation appointed at the Conference held at Edinburgh on 20th September would be received by H.M. Secretary of State for Scotland on 7th December at 11 A.M. The Society's representatives on the deputation were Mr P. O. Turnbull, Smeaton, Dalkeith; Mr Robert Park, Brunstane, Portobello; and the Hon. Walter T. H. Scott, Master of Polwarth, Harden, Hawick.

Grants to Local Societies.

A Report by the Shows Committee, dated 4th December, relating to Grants to Local Societies, was submitted and approved.

Mr Thomas Elder raised a question with regard to giving increased Money Grants to the larger District and County Societies, and it was agreed that this matter be remitted to the Shows Committee for consideration and report.

Mr N. H. Constable pointed out that certain Local Societies were in the un-

fortunate position of not being entitled to receive their grant on account of their Chairman or Convener not being a member of the Highland Society. This matter also was remitted to the Shows Committee for consideration and report.

Finance;

A Minute of Meeting of Committee, dated 4th December, was submitted and approved.

The Minute dealt with the following matters:—

Hannah Dairy Research Institute.—In accordance with the remit from the Board at last Meeting, the Committee had considered the application from Sir Donald MacAlister, Chairman of the Joint Committee of Management of the Hannah Dairy Research Institute, and recommended that a grant be given, as requested, of £500 towards the provision of equipment for the Institute's Laboratories and Library, and a grant of £1000 towards an Endowment Fund.

Scottish Agricultural Organisation Society.—It was recommended that a grant of £100 be again given to the Scottish Agricultural Organisation Society for the year 1930.

Revision of Bye-Laws.—The Secretary had reported that he had now received from the Society's Law Agents a Memorandum dealing with the revision of the Bye-Laws of the Society. It was agreed that the Memorandum should, in the first instance, be considered in detail by the Sub-Committee appointed in May last.

New Cultivating Harrow.

A letter was submitted from Sir Robert Greig, Secretary of the Department of Agriculture for Scotland, forwarding particulars of a new Cultivating Harrow invented by Major Andrew M'Dowall, Mungoswells, Drem.

It was agreed that the letter and particulars be remitted to the Implement Committee for consideration and report.

MEETING OF DIRECTORS, 8TH JANUARY 1930.

Mr J. ERNEST KERR of Harviestoun, Dollar, in the Chair.

Present.—Ordinary Directors—Mr James P. Brown; Mr Norman H. Constable; Mr J. Bryce Duncan; Mr James Durno; Mr Thomas Elder; Mr George Grant; Mr James R. Lumsden; Mr James M'Queen; Mr Alexander Munro; Mr Alexander Murdoch; Mr Alexander Niven; Mr John W. Prentice; Mr T. Mercer Sharp; Major R. W. Sharpe; Mr Thomas Templeton; Colonel R. W. Walker; Mr Archibald Whyte. *Extraordinary Directors*—Mr John Elliot; Mr W. P. Gilmour; Mr F. N. M. Gourlay; Mr John Hewetson; Mr A. Thornton Hunter; Mr William C. Hunter; Mr J. Ernest Kerr; Mr Murray Little; Mr William Low; Mr Matthew C. Lusk; Mr Alexander N. M'Caig; Mr James M'Laren; Mr Robert Macmillan; Dr T. G. Nasmyth. *Hon. Secretary*—Colonel F. J. Carruthers. *Chemist*—Dr J. F. Tocher. *Consulting Engineer*—Professor R. Stanfield. *Consulting Entomologist*—Dr R. Stewart MacDougall.

The late Sir Kenneth J. Mackenzie of Gairloch, Bart.

Before proceeding with the business of the Meeting, the Chairman referred in sympathetic terms to the death of Sir Kenneth J. Mackenzie of Gairloch, Bart. Sir Kenneth, he said, had been a member of the Society for thirty-four years, a Director for four years—from 1919 to 1922,—and a Vice-President in 1923, when he acted as Convener of the Local Committee of the Inverness Show. He took a keen interest in the work of the Society, and rendered valuable services as a member of several of the Standing Committees, including those dealing with Forestry and the Argyll Naval Fund, of both of which he was a member up till the date of his death.

It was unnecessary, he added, to refer at length to Sir Kenneth's services to

the country as a soldier, and in the important office of King's and Lord Treasurer's Remembrancer. He devoted much time to public affairs, especially in matters relating to Agriculture and Afforestation, and as Convener of the County Council of Ross and Cromarty he rendered valuable services to his native county, by which his memory would long be held in affectionate regard.

A Minute of regret and sympathy was submitted and adopted, the members present upstanding, and the Secretary was instructed to forward a copy to Lady Mackenzie and the family of the deceased.

The late Mr James Gray.

The Chairman also referred in sympathetic terms to the death of Mr James Gray, Glenoonah, Kippen, and formerly of Birkenwood. Mr Gray, he said, had been connected with the Society as a member for nearly forty years, and recently served as a Director on the Board for a period of five years. As an Agriculturist he was well known and highly esteemed in his own district, where he rendered valuable service on various public bodies. It was, however, as a breeder, exhibitor, and judge of Clydesdale Horses that his skill and reputation were known and acknowledged throughout a much wider area. He took a keen interest in the Society's Annual Shows, where his readiness to undertake any duties assigned to him, and his assiduity in discharging these duties, could not fail to be recognised and appreciated. His death would be mourned by the many members of the Board to whom he was so well known, and by whom he was so highly respected.

A Minute of regret and sympathy was submitted and adopted, the members present upstanding, and the Secretary was instructed to forward a copy to Mrs Gray and the family of the deceased.

Letters.

The following letters were submitted:—

Lady Blythswood.—Expressing thanks for resolution of sympathy on the death of her husband, the late Lord Blythswood.

Mr Ian M. Campbell, Tighnamara, Dornoch.—Agreeing to accept office as a Director of the Society in place of Lieut.-Col. T. W. Cuthbert, C.M.G., D.S.O., resigned.

Town Clerk, Dundee.—Intimating that, although a Parliamentary Committee had refused the Corporation the right to rate for a grant towards the expenses of the Highland Show, the Town Council would still be prepared, financially and in other ways, to hold out inducements for the Show to come to Dundee.

Potato Marketing Board.—A letter, dated 7th January, was read from the Secretary of the Special Scottish Emergency Committee of the British United Potato Marketing Board, forwarding copy of a resolution passed at a mass meeting and conference of the Potato Industry held at Perth on 3rd January. It was stated that the Committee would shortly ask the Society to nominate a prominent grower as a member of the Permanent Board in Scotland, and in the meantime requested the Society to help the work of the Committee by giving a donation to the funds. Mr Alexander Murdoch pointed out that there were at present two schemes before the country, and he thought both schemes should be examined before a representative was appointed. He moved that the matter be remitted to the Finance and Law Committee for consideration and report. This was seconded by Mr Thomas Elder, and was agreed to.

Warble Fly.

Colonel F. J. Carruthers of Dormont reported on the proceedings at a recent meeting of the Leathersellers' Committee in London. The Committee were of opinion, he said, that the time was not yet ripe to press for general compulsory treatment against Warble Fly. A report of work done by the Worcestershire County Council, by way of experiment and demonstration, had been received, and the Committee were raising funds to help other County Councils to carry out similar work. In Scotland they were in a different position, for the Agricultural Colleges would have to carry on the work. These Colleges had no funds to spare to initiate demonstrations of that kind. If it were desired to carry on demonstrations in Scotland, it would, he thought, be for the Society to initiate them, and he suggested that a Committee might be instructed to get in touch with the three Agricultural Colleges with a view to having demonstration areas,

possibly one in every County in Scotland. If that were done, they would be taking a big step towards convincing the farmer of the practicability and utility of the treatment, and would be paving the way for compulsion if they wished to press for that later.

Dr R. Stewart MacDougall, Consulting Entomologist to the Society, exhibited a number of damaged hides and specimens of the Warble Grub and Fly.

After some discussion the matter was remitted to the Science Committee, with powers to approach the Agricultural Colleges with a view to arranging for demonstrations being carried out during the present season.

Finance.

A Minute of Meeting of Finance Committee, dated 8th January, was read and approved.

The Minute stated that the Accounts for the year 1928-1929, as prepared by the Society's Auditor, had been submitted and approved, and signed by two members of the Finance Committee and by the Auditor.

Dumfries Show, 1930.

Stewards.—Colonel F. J. Carruthers moved that, at that Meeting, only the principal Steward for each department be appointed, and that it be left to the principal Steward to bring forward the name of an assistant at next Meeting, where such was required. This was agreed to.

The Stewards of the various departments were then appointed as follows: *Cattle*—Mr James Durno; *Horses*—Mr Alexander Murdoch; *Sheep, Goats, Pigs, and Wool*—Mr Robert Macmillan; *Grand Stands*—Mr James M'Queen; *Forage*—Mr John W. Prentice; *Gates*—Mr William S. Niven; *Implement*—Mr William Low; *Poultry and Rabbits*—Mr James R. Lumsden; *Catering and Honey, &c.*—Major R. W. Sharpe.

Veterinary Inspector.—Mr James Lindsay, M.R.C.V.S., Dumfries, was appointed Veterinary Inspector for the Show on the usual conditions.

Minute of Shows Committee.—A Minute of Meeting of Shows Committee, dated 8th January, was submitted and approved.

The Minute dealt with the following matters:—

Ayrshire Cows in Milk.—It was recommended that a letter which had been received from the Ayrshire Cattle Herd-Book Society, suggesting the insertion of a rule to the effect that all animals in milk, in the Ayrshire Cattle Classes, be milked out in the ring before the awards were made, be remitted to the following Sub-Committee for consideration and report—Mr W. P. Gilmour (*Convener*), Sir David Wilson, Bart., Mr Alexander Murdoch, Mr George Will, and Mr Alexander N. M'Caig.

Bacon Pig Competition.—It was recommended that the Society contribute £40 towards the cost of the competition this year.

Suffolk Horse Society.—In view of further correspondence which had taken place with the Suffolk Horse Society, it was recommended that a class be provided for Mares, and one for Geldings, on the same lines as those provided for Shires, and subject to the same condition that the Suffolk Horse Society contribute 40 per cent of the prize money.

Special Prizes.—A number of Special Prizes were accepted, and votes of thanks accorded to the donors.

New Cultivating Harrow.

A Minute of Meeting of Implements Committee, dated 8th January, was submitted and approved.

The Minute recommended that the Directors do not apply to the Empire Marketing Board for a grant to build an experimental Cultivating Harrow on the principles suggested by Major Andrew M'Dowall. From the information obtainable from the drawings and particulars submitted, the Committee were not satisfied that the proposal was a practical one.

Proposed Quarantine Station.

The Secretary submitted further information regarding the London Quarantine Station, which he had obtained from the Secretary of the Royal Agricultural

Society of England. From this it appeared that of the 979 animals which had passed through the London Station up to date, 166 were from Scotland, comprising 132 Cattle, 28 Sheep, 4 Pigs, and 2 Goats.

West of Scotland Agricultural College.

An application from the West of Scotland Agricultural College, for a grant in aid of the building and equipment fund which is being raised by the College, was remitted to the Finance Committee for consideration and report.

Proposed Joint Conference on the Present Condition of Agriculture.

A letter was submitted from the Secretary of the East Lothian Branch of the national Farmers' Union stating that, at a largely attended meeting of farmers held at Haddington on 20th December, it was decided to suggest that the Highland and Agricultural Society arrange for a Joint Conference of Agricultural bodies to consider the present condition of Agriculture and endeavour to formulate a uniform policy.

After some discussion it was agreed, on the Motion of the Chairman, that the matter be remitted to the Finance and Law Committee for consideration and report.

Transport Bill.

A letter was read from the Secretary of the Scottish Branch of the Land Agents' Society, inquiring if the Society would be prepared to support the Land Agents' Society in an endeavour to get a clause inserted in the Transport Bill, now before Parliament, to the effect that effective Spark Arresters should be fitted to all forms of Steam Waggon and Tractors using public roads.

It was unanimously agreed to support the proposal contained in the letter.

Hannah Dairy Research Institute.

On the Motion of the Chairman, it was unanimously agreed to confirm the recommendation adopted at last Meeting, that a grant of £1500 be given to the Hannah Dairy Research Institute, being £500 towards the provision of equipment for the Institute's Laboratories and Libraries, and £1000 towards an endowment fund.

Scottish Agricultural Organisation Society.

On the Motion of the Chairman, it was also unanimously agreed to confirm the recommendation adopted at last Meeting, that a grant of £100 be given to the Scottish Agricultural Organisation Society for the current year.

Show of 1932.

Mr Alexander Munro of Leanach, moved: "That provided a suitable site is available, and satisfactory financial and other arrangements can be made, the Society's Show of 1932 be held in the Inverness Show Division."

The Motion was seconded by Mr John Elliot, and unanimously agreed to.

Argyll Naval Fund.

A Minute of Meeting of Argyll Naval Fund Committee, dated 7th January, was read and approved.

The Minute recommended that the following be appointed to fill three vacancies in the list of beneficiaries: James Hamilton Dundas, Kenneth Campbell Grieve, and David Barclay Nairne Mellis.

Finance.

A Minute of Meeting of Finance Committee, dated 8th January, was submitted and approved.

The Minute recommended that Mr J. E. Kerr of Harviestoun be appointed a Trustee of the Royal (Dick) Veterinary College Centenary Post-Graduate Fellowship to fill the vacancy caused by the death of the late Lord Forteviot.

MEETING OF DIRECTORS, 5TH FEBRUARY 1930.

Mr J. ERNEST KERR of Harviestoun, Dollar, in the Chair.

Present.—Ordinary Directors—Mr Ian Macgregor Campbell; Mr Norman H. Constable; Sir James Inglis Davidson; Mr James Durno; Mr Thomas Elder; Mr James R. Lumsden; Mr James M'Clean; Mr William Meiklem; Mr Alexander Murdoch; Mr Robert Park; The Lord Scone; The Hon. Walter T. H. Scott; Mr T. Mercer Sharp; Major R. W. Sharpe; Mr John P. Sleigh; Mr Phipps O. Turnbull; Mr George Will. *Extraordinary Directors*—Mr John Elliot; Mr W. P. Gilmour; Mr John Hewatson; Mr A. Thornton Hunter; Mr William C. Hunter; Mr J. Ernest Kerr; Mr William Low; Mr James M'Laren; Mr Robert Macmillan; Dr T. G. Nasmyth; Mr Charles W. Ralston. *Treasurer*—Sir David Wilson, Bart., D.Sc. *Hon. Secretary*—Colonel F. J. Carruthers. *Chemist*—Dr J. F. Tocher.

Letters.

The following letters were submitted :—

Lady Forteviot.—Expressing thanks for resolution of regret and sympathy on the death of her husband, the late Lord Forteviot.

Lady Marjorie Mackenzie.—Expressing thanks for resolution of regret and sympathy on the death of her husband, the late Sir Kenneth J. Mackenzie of Gairloch, Bart.

Science.

A Minute of Meeting of Committee, dated 5th February, was submitted and approved.

The Minute dealt with the following matters :—

Schedule of Unit Values.—The Schedule of Unit Prices of Manures and Feeding-Stuffs for the current year had been revised, and it was recommended that it be printed and issued as usual.

Values of Unexhausted Manures and Feeding-Stuffs.—It was recommended that the Table of Values of Unexhausted Manures and Feeding-Stuffs be re-issued, and that it be remitted to Dr Tocher, Consulting Chemist, to revise it in terms of the new Unit Values.

Dumfries Show, 1930.

Assistant Stewards.—Assistant Stewards of the various Departments were appointed as follows: *Cattle*—Mr Alexander Munro; *Horses*—Mr George Grant; *Sheep, Goats, Pigs, and Wool*—Mr N. H. Constable; *Grand Stands*—The Master of Polwarth; *Forage*—Mr T. Mercer Sharp; *Gates*—Mr John Robson, Jun.; *Implements*—Mr J. P. Ross Taylor.

Forage.—A Minute of Meeting of Forage Committee, dated 5th February, was read and approved.

The Minute stated that only one tender for the supply of forage had been received, this being from the Forage Supply Co., Ltd., Springfield Mills, Leith. It was recommended that it be left to the Convener and the Secretary to adjust with the Forage Supply Company the price to be charged for the green food, with power to accept the tender on this item being arranged to their satisfaction.

Timber Contract.—A Minute of Meeting of Show Contracts Committee, dated 4th February, was read and approved.

The Minute stated that, in accordance with the remit from the Board in February 1929, the Committee had considered the suggestion put forward by Mr N. H. Constable, that the Society insist on at least 75 per cent of the timber used in the Showyard being home-grown. After careful consideration, the Committee had decided to recommend that no action be taken on the lines suggested at the present time. This decision was arrived at in view of the fact that, in former years, tenders for home timber had been specially invited, and no such tenders had ever been received, and also in view of the fact that, from letters received from some of the leading timber merchants, it appeared that if such a condition were inserted, they would not be prepared to offer.

It was further recommended that tenders be advertised for in the usual way, these to be sent in not later than 19th March, and that it be left to Mr James McLaren, Mr John Elliot, Professor Stanfield, and the Secretary to open the tenders and accept the most suitable offer.

Ayrshire Cows.—A Minute of Meeting of a Sub-Committee appointed by the Shows Committee was read and approved.

The Minute stated that, in accordance with the remit from the Shows Committee, the Sub-Committee had considered the letter from the Ayrshire Cattle Herd-Book Society, dated 11th December, with regard to the 'doctoring' of Cattle at Shows. After careful consideration, the Sub-Committee had agreed to recommend that the Society adopt the suggestion of the Ayrshire Cattle Herd-Book Society, and add the following Rule to Regulation 42:—

"All animals in milk, in the Ayrshire Cattle Classes, must be milked out in the ring before the awards are made."

Suffolk Horses.—A letter was submitted from the Suffolk Horse Society agreeing to contribute 40 per cent of the prize money for the two classes proposed. They also forwarded a list of recommended Judges, from which it was agreed to appoint Sir Merrik R. Burrell, Bart., Floodgates, West Grinstead, Horsham, as Judge.

Percheron Horses.—In view of letters received from prospective exhibitors of Percheron Horses, it was decided that, if the British Percheron Horse Society so desired, facilities be given for the entry of six Percherons for exhibition only.

Dumfries and Galloway Club.—A letter was submitted stating that the Committee of the Club had elected the Directors and Officials of the Society as Honorary Members of the Club while in Dumfries in connection with the Show. The Secretary was instructed to thank the Club for their courtesy in granting this privilege.

New Implements.—The following were appointed Judges of New Implements: Mr William Low of Balmakewan, Laurencekirk; Mr P. O. Turnbull, Smeaton, Dalkeith; and Mr J. P. Ross Taylor, Mungoswalls, Duns.

Special Prizes.—A number of Special Prizes were accepted, and votes of thanks accorded to the donors.

Warble Fly

A Minute of Meeting of Science Committee, dated 5th February, was read and approved.

The Minute recommended that a sum not exceeding £500 be voted to meet the cost of experiments in the eradication of Warble Fly in Scotland during the coming season. Part of this sum might be recovered from the fund being raised by the Leathersellers' Company, and to which the Empire Marketing Board had contributed £1000.

It was remitted to the following Sub-Committee to arrange details: Colonel F. J. Carruthers, *Convener*, Dr T. G. Nasmyth, *Vice-Convener*, Mr J. E. Kerr, Sir David Wilson, Bart., Mr William Low, Dr R. Stewart MacDougall, Dr J. F. Tocher, together with the Principals of the three Agricultural Colleges.

Agricultural Depression.

A Minute of Meeting of Finance and Law Committee, dated 5th February, was read and approved.

The Minute stated that, in accordance with the remit from the Board, the Committee had considered various communications in which it was suggested that the Society should call a Conference of all the Agricultural bodies in Scotland to consider the present state of Agriculture, and suggest a uniform policy.

The main difficulty in acting upon these suggestions was that the Society had, in the past, consistently refrained from entering into any question of a political character. With so large a membership, embracing all shades of political opinion,

it would not be possible for the Society to send representatives to a Conference who could represent the views of the Society as a whole.

In view, however, of the present very serious position of Agriculture, the Committee recommended, in the first instance, that the Directors call a Meeting of representatives of the Scottish Chamber of Agriculture, the National Farmers' Union of Scotland, the Scottish Farm Servants' Union, and the Scottish Land and Property Federation. The Joint Meeting would be held in the Society's Chambers on Wednesday, 19th February, and the Society would nominate an independent Chairman. Each of the bodies mentioned would be asked to send not more than six representatives.

Potato Marketing Board.

A Minute of Meeting of Finance and Law Committee, dated 5th February, was read and approved.

The Minute stated that, in accordance with the remit from the Board, the Committee had considered the communications received from the Special Scottish Emergency Committee of the British United Potato Marketing Board. In these communications it was suggested that the Directors nominate one member of the Society to act on the Scottish Board of the British United Potato Marketing Board, and also contribute to the fund.

After careful consideration, the Committee had agreed to recommend that no action be taken on the lines suggested.

Damage by Deer.

Letters were read from the Under-Secretary of State for Scotland, referring to the Conference which took place on 4th December last between the Department of Agriculture for Scotland and representatives of Scottish Agricultural Societies and the Scottish Land and Property Federation, and stating that, in compliance with the wish expressed at that Meeting, the Secretary of State for Scotland would be glad to meet representatives of the Societies and the Federation in Edinburgh on Friday, 7th February, at 12 noon.

It was agreed that Mr John Elliot, Mr Archibald Whyte, and Mr Peter M'Intyre be appointed to represent the Society at the proposed Meeting.

Inverness Show, 1932.

The Stewards of Cattle and Horses, and the Local Directors for the Inverness Show Division, were appointed a Committee to visit and inspect the site proposed for the Inverness Show of 1932.

Date of Board Meeting.

Mr Robert Park moved that the next Meeting of the Board be held on Friday, 7th March, instead of 5th March, in view of the fact that the latter date clashed with the date of the Scottish Stallion Show in Glasgow.

Mr Alexander Munro seconded.

Other proposals in favour of the 5th and the 12th were submitted, but it was eventually decided, by a majority, that the proposed change to Friday, the 7th, be adopted.

Finance.

The remainder of the Minute of Meeting of Finance Committee, dated 5th February, was submitted and approved.

The Minute stated that a letter had been received from the Town Clerk of Edinburgh, containing an offer of £3750 for the Society's premises at 3 George IV. Bridge, and the Committee recommended that the offer be accepted.

Forestry Examination.

The Secretary reported that, up to the present, one entry had been received for the Society's Examination in Forestry, which was advertised to be held in March. Other entries might be received before the closing date.

It was agreed that the following Examiners be appointed to carry through the Examination: *Forestry*, Mr G. U. Macdonald; *Forest Botany and Forest Zoology*, Dr R. Stewart MacDougall; *Meteorology and Geology*, Dr Robert Campbell; *Forest Engineering and Surveying*, Professor R. Stanfield; *Arithmetic and Book-keeping*, Mr George James Gregor, C.A.

MEETING OF DIRECTORS, 7TH MARCH 1930.

Mr J. ERNEST KERR of Harviestoun, Dollar, in the Chair.

Present.—Ordinary Directors—Mr James P. Brown; Mr Norman H. Constable; Sir James Inglis Davidson; Mr James Durno; Mr George Grant; Mr James R. Lumsden; Mr James M'Clean; Mr William Meiklem; Mr Alexander Murdoch; Mr Robert Park; Mr John W. Prentice; Mr T. Mercer Sharp; Mr J. P. Ross Taylor; Mr Thomas Templeton; Mr Phipps O. Turnbull; Colonel R. W. Walker. *Extraordinary Directors*—Mr John Elliot; Mr W. P. Gilmour; Mr F. N. M. Gourlay; Mr William C. Hunter; Mr J. Ernest Kerr; Mr William Low; Mr Matthew C. Lusk; Mr Alexander Neilson M'Caig; Mr James M'Laren; Mr Robert Macmillan; Mr George A. Marshall; Dr T. G. Nasmyth; Mr Charles W. Ralston. *Hon. Secretary*—Colonel F. J. Carruthers. *Consulting Engineer*—Professor R. Stanfield. *Consulting Entomologist*—Dr R. Stewart MacDougall.

The late Sir Henry Dundas, Bart.

Before proceeding with the business of the Meeting, the Chairman referred, in sympathetic terms, to the death of Sir Henry Dundas, Bart., which occurred suddenly on his way to South Africa. Sir Henry, he said, served as an Ordinary Director on the Board for a period of four years, and was also an Extraordinary Director during the year of the last Edinburgh Show. He took a live interest in the work of the Society, and was especially interested in Agricultural Education. He was connected with many public bodies, to which he devoted much time and attention. He was most conscientious in the discharge of all public duties, and his genial personality gained for him the esteem and regard of all with whom he was associated.

A Minute of regret and sympathy was submitted and adopted, the members present upstanding, and the Secretary was instructed to forward a copy to Lady Dundas and the family of the deceased.

Letters.

The following letters were submitted:—

Association for the Preservation of Rural Scotland.—Forwarding copy of the Rural Amenities Bill. It was agreed that this be remitted to the Law and Finance Committee for consideration and report.

British Friesian Cattle Society.—Regarding the Order recently issued by the Ministry of Health prohibiting the exhibition at Agricultural Shows of animals from Tuberculin Tested Herds. It was agreed that this was a matter which might be left to the Breed Societies.

Mr Allan Barns-Graham.—Forwarding copies of a pamphlet on "Our Milk Supply."

Dumfries Show, 1930.

Proof of Prize List.—A proof print of the Prize List and Regulations was submitted and considered.

On the Motion of Mr Alexander Murdoch, it was remitted to the Stewards of Stock, with powers, to adjust the times of Judging, and to fix the position of the rings where the various classes of horses should be judged.

On the suggestion of Mr W. P. Gilmour it was agreed that a reference to Rule 42 be inserted at the foot of page 23 (Ayrshire Cattle). The Secretary was instructed to notify all exhibitors of Ayrshire Cows in Milk that they must provide pails for milking in the Judging rings so that there may be no delay in the judging.

The Prize List and Regulations were then approved for publication.

Forage.—The Secretary reported that the price of green food had now been adjusted with the Forage Supply Co. Ltd., and their tender had accordingly been accepted.

Timber Contract.—The Secretary also reported that, in accordance with the authority given at last Meeting, the Sub-Committee appointed had opened and considered five tenders for the supply of timber, and had accepted that from Messrs R. L. Robertson & Co., Seafeld Sawmills, Dumfries, which was the lowest.

Minute of Shows Committee.—A Minute of Meeting of Shows Committee, dated 7th March, was read and approved.

The Minute dealt with the following matters :—

Free Stands.—Free Stands and Free Sites at the Show were recommended to be granted, according to a list submitted.

Horse-Shoeing.—It was recommended that the following practical shoeing-smiths be invited to act as Judges of Horse-Shoeing, along with the Society's Veterinary Inspector: Mr Robert Fenwick, Victoria Smithy, Dundee; and Mr George Marshall, Gateside, Beith.

It was also recommended that the following be appointed a Committee of Management: *Highland and Agricultural Society*—Mr George Will, Mr Matthew C. Lusk, and Mr Alexander N. M'Caig. *Farriers' and Blacksmiths' Association*—Mr Edward Martin, Closeburn, by Thornhill; Mr Adam Hetherington, Amisfield, by Dumfries; and Mr James Irving, Shakespeare Street, Dumfries.

Suffolk Sheep.—It was agreed to grant the Suffolk Sheep Society (Northern Area) permission to hold an Auction Sale of Suffolk Ram Lambs in the Showyard on the Thursday afternoon.

New Zealand Dairy Farmers' Tour.—In connection with a proposed visit of a party of New Zealand Dairy Farmers to the Show on Tuesday, 22nd July, it was agreed that the members of the party be given free admission to the Show, that they be received by the Chairman and Mr W. P. Gilmour, and that arrangements be made to entertain them to luncheon in the Showyard, provided intimation was received beforehand of the number expected.

Percheron Horses.—A letter was read from the British Percheron Horse Society expressing thanks for the offer to allow Percheron Horses to be sent for exhibition only, and stating that six animals would be sent—namely, two Stallions two Mares, and two Geldings.

Catering.—A Minute of Meeting of Catering Committee, dated 7th March, was submitted and approved.

The Minute recommended that there be four licensed catering stands in the Showyard, these to be in the hands of the following caterers: Royal Athenæum, Aberdeen; Messrs Alexander Fairley & Sons, 83 Leith Street, Edinburgh; Messrs William and R. S. Kerr (Glasgow) Ltd., 272 St Vincent Street, Glasgow; and Messrs M. Mitchell & Co. Ltd., 2 Gloucester Place, Edinburgh. The tea stand would again be in the hands of Mr John Henderson, Aberdeen. The British Women's Temperance Association would, as usual, have an unlicensed refreshment stand.

It was agreed that a condition be imposed on all the caterers, as formerly, that only home-fed meat shall be supplied in the catering stands.

Hundredth Show, 1931.

A Minute of the Hundredth Show Committee, dated 7th March, was submitted and approved.

The Minute stated that the Committee had met on two occasions and had given general consideration to the arrangements for the Hundredth Show in 1931.

In order that the Show might have a national character, they desired to recommend to the Directors that an instruction be given to the Office-Bearers' Committee to nominate not less than ten, and not more than fifteen, additional Extraordinary Directors for the year 1931. These additional Extraordinary Directors would be selected from parts of the country which were outside the Edinburgh Show Division.

The Committee had also agreed to recommend that an increase of 50 per cent be made in the prize-money allocated for each section of Cattle, Horses, Sheep, and Pigs. An intimation to this effect had been sent to the various Breed Societies, and their co-operation had been invited in suggesting as to how best this additional prize-money should be utilised. They had also been asked to consider whether they would be prepared to make any contribution to the Prize Fund, either in the nature of additional prize-money or Special Prizes. Replies had been received from practically all the Breed Societies, and these were in every case favour-

able. Some of the Societies proposed to increase their contribution to the Prize Fund, and others proposed to give additional Special Prizes. Further particulars regarding these would be given later.

Warble Fly.

Dr R. Stewart MacDougall reported that arrangements had now been made for two demonstration areas within the area of each of the three Agricultural Colleges in Scotland. Meetings were being held with the College Authorities, County Organisers, and those who would carry out the actual treatment of the animals, at which all details would be discussed, and everything made ready for a start at the beginning of April. Arrangements had also been made with the firms concerned for the supply of the necessary material for dressings.

Agricultural Depression.

The Chairman reported with regard to the proceedings at the Joint Meeting which was held in the Society's Chambers on 19th February.

On a recommendation of the Finance and Law Committee, it was decided to appoint six representatives to attend the next Joint Meeting, it being, however, expressly understood that these could not represent the considered views of the Society as a whole. The six representatives appointed were as follows: Mr J. E. Kerr, Colonel F. J. Carruthers, Mr James M'Laren, Mr P. O. Turnbull, Mr James Durno, and Mr Alexander Munro.

Letters, forwarding copies of resolutions passed at Mass Meetings of Agriculturists held at Golspie, Elgin, Nairn, Inverness, Forfar, and Thurso, were submitted.

National Mark Potatoes.

A letter was read from the Department of Agriculture for Scotland, directing attention to a display and sale of National Mark Potatoes at an Empire Marketing Board shop in Glasgow from 3rd to 15th March.

PROCEEDINGS AT GENERAL MEETINGS.

GENERAL MEETING, 5TH JUNE 1929.

Mr J. E. KERR of Harviestoun, *Vice-President*, in the Chair.

New Members.

One hundred and ninety-three candidates were balloted for and admitted members of the Society.

Election of Office-Bearers.

The following noblemen and gentlemen were elected office-bearers of the Society for the year 1929-30:—

President.—The Duke of Buccleuch and Queensberry, K.T., Drumlanrig Castle, Thornhill, Dumfriesshire.

Vice-Presidents.—The Earl of Stair, D.S.O., Lochinch, Castle Kennedy; Sir Herbert E. Maxwell of Monreith, Bart., D.C.L., LL.D., F.R.S., Whauphill; Mr W. J. H. Maxwell of Munches, Dalbeattie; Sir John W. Buchanan-Jardine of Castlemilk, Bart., Lookerbie.

Ordinary Directors, 1926.—Mr James M'Queen of Crofts, Dalbeattie; Mr Alexander Munro of Leanach, Culloden Moor, Inverness; Mr Alexander Niven of Collairnie, Ladybank; Mr Norman H. Constable, Bute Estate Office, Rothesay; Mr J. P. Ross Taylor, Mungoswalls, Duns; Mr Phipps O. Turnbull, Smeaton, Dalkeith; Mr James Durno, Crichtie, Inverurie; Brig.-General Archibald Stirling of Koor, Dunblane.

1927.—Mr William Meiklem, Bennoch Park, Kirkcaldy; Sir Thomas Paxton, Bart., LL.D., 22-28 Adelphi Street, Glasgow; Hon. Walter T. H. Scott, Master of Polwarth, Harden, Hawick; Sir James Inglis Davidson, Saughton Mains, Corstorphine; Mr George Grant, Glenfarclas, Blacksoat; Mr John W. Prentice, Craigrie Farm, Clackmannan; Mr James M'Clean, Craigmount, Portpatrick.

1928.—Mr Archibald Whyte, Spott, Kirriemuir; Mr Alexander Murdoch, East Hallside, Hallside, Lanarkshire; Mr Thomas Templeton, Sandyknowe, Kelso; Mr Robert Park, Brunstane, Portobello; Colonel Robert W. Walker, Portlethen, Aberdeen; Mr James R. Lumsden of Arden, Dumbartonshire; Mr John Bryce Duncan, Newlands, Dumfries; Mr John Robson, jun., Lynegar, Watton, Caithness.

1929.—Mr A. A. Hagart Speirs of Elderslie, Houston House, Houston; Major Robert W. Sharpe of The Park, Earleston; Mr Thomas Elder of Stevenson, Haddington; Mr John P. Sleight of St John's Wells, Fyvie; Mr T. Mercer Sharp, Bardrill, Blackford; Mr George Will, Crichton Royal, Dumfries; Mr James P. Brown, Dipple, Fochabers; The Lord Scone, Scone Palace, Perth.

Extraordinary Directors.—Mr William Low of Balmakewan, Laurencekirk; Mr Robert Macmillan of Holm of Dalquhairn, Woodlea, Moniaive; Mr William S. Niven, The Loan, Errol; Mr John Elliot, Balnakiel, Galashiels; Mr James M'Laren, Cornton, Bridge of Allan; Mr William C. Hunter of Arngask, Glenfarg; Mr W. P. Gilmour, Balmangan, Kirkcudbright; Dr T. G. Nasmyth, Canaan

Lodge, 43 Canaan Lane, Edinburgh; Mr J. E. Kerr of Harviestoun, Dollar; Mr A. Thornton Hunter (Alexander Jack & Sons, Ltd.), Maybole; Major C. R. Dudgeon, Cargen Holm, Dumfries; Mr F. N. M. Gourlay, Kirkland, Tynron, Thornhill; Mr John Hewetson, Baltersan, Newton Stewart; Mr Murray Little, Summerhill, Annan; Mr Matthew C. Lusk, Airlie, Castle Douglas; Mr Alexander N. McCaig, Challock, Stranraer; Mr Charles S. McKerrow, Boreland of Southwick, Dumfries; Mr George A. Marshall, Mansefield, Kirkcudbright; Provost D. O'Brien, Dumfries; Mr Charles W. Ralston, Dabton, Thornhill.

Treasurer.—Sir David Wilson, Bart., D.Sc., of Carbeth, Killearn.

Honorary Secretary.—Colonel F. J. Carruthers of Dormont, Lockerbie.

Vacancy on Board of Directors.

Mr James M'Laren, Cornton, Bridge of Allan, Chairman of Directors, moved the following recommendation of the Board of Directors: That Mr John Bryce Duncan, Newlands, Dumfries, be elected an Ordinary Director of the Society for the Dumfries Show Division, to fill the vacancy caused by the appointment of Colonel F. J. Carruthers of Dormont to the office of Honorary Secretary.

The motion was unanimously adopted.

Special Grants.

Sir David Wilson, Bart., D.Sc., Convener of the Finance Committee, moved approval of the following Special Grants, which were recommended by the Board of Directors:—

- (1) £200, for the current year, to the Animal Diseases Research Association.
- (2) £50 to the Scottish National Milk and Health Association.
- (3) £30 to the Highland Reel and Strathspey Society.

Mr James M'Queen of Crofts, Dalbeattie, seconded, and the grants were approved.

Alloa Show, 1929.

Mr James Lumsden of Ardon, Convener of the Shows Committee, reported, as follows:—

The arrangements for the forthcoming Show at Alloa, on 23rd July and three following days, are well advanced. An area of about 55 acres within Alloa Park has been enclosed for the purposes of the Showyard, and most of the principal buildings have already been erected. The dry weather which prevailed during April and May permitted of the timber and other heavy material being moved on to the ground with a minimum of damage to the surface.

The site, as previously reported, is beautifully situated, and its ample proportions permit of the Showyard being planned on a liberal scale. It is convenient of access, both by rail and by road, and the Town Council of Alloa is doing everything in its power to further the success of the Show.

Entries of Implements, Machinery, and other exhibits, which have now closed, are above the average, a total of about 9000 feet (frontage) having been applied for. This is about 400 feet more than at Aberdeen last year. Entries of Stock close to-day, and, while no figures are available, it appears certain that the entry will be a satisfactory one.

Provided good weather is experienced before and during the Show, there appears to be no doubt that the Show at Alloa will be a distinct success.

Dumfries Show, 1930.

Mr W. P. Gilmour, Balmangan, Kirkcudbright, reported that the arrangements for the Show of 1930, to be held at Dumfries, were progressing satisfactorily. The Society had been fortunate in again securing an excellent site at Rotchell Park, where the Show was held in the years 1910 and 1922. The site comprised three fields of old pasture, extending to about 48 acres. Eight acres or thereby could conveniently be fenced off for a Motor Enclosure, leaving 40 acres available for the Show. Gas and water were both available on the ground, and the Town Council of Dumfries had offered a free supply of water, gas, and electric power, together with an increased donation of £100 towards the expenses of the Show.

Edinburgh Show, 1931.

Bailie William Poole, Englewood, Blackhall, reported that arrangements were proceeding for the Hundredth Show in 1931, to be held at Edinburgh. By the courtesy of the Town Council of Edinburgh an excellent site had been made available at Saughton Park, and the town had also promised a grant of £500 to the Show funds and a Gold Cup for competition at the Show.

Proposed Quarantine Station.

Mr Alexander Murdoch, C.A., East Hallside, Hallside, Lanarkshire, reported as follows :—

At this time last year the Directors reported that they had entered into negotiations for a site for the proposed Quarantine Station for Scotland in the vicinity of Princes Dock, Glasgow. Plans and specifications of the proposed buildings were prepared and forwarded to the Empire Marketing Board for approval. At the same time disappointment was expressed at the small advantage which was being taken of the Station in London, and it was suggested that the Ministry of Agriculture and the Empire Marketing Board should take steps to ascertain from the various Colonies and Dominions whether they would be prepared to accept stock from Scotland which had passed through the proposed Station.

As a result of further consideration the Empire Marketing Board decided that it would be in the interests, both of that Board and of this Society, to suspend operations in regard to the proposed Glasgow Station until a later date, when further experience would have been gained, and time would have allowed the Oversea Governments of the Empire to assure themselves of the rigid precautions provided against the infection of animals passing through the London Station.

No further steps have accordingly been taken with regard to the Glasgow Station. An arrangement has, however, been entered into with the London, Midland & Scottish Railway Company whereby an option has been secured over the proposed site for a period of three years.

Mr Murdoch added that if any of the Breed Societies desired that steps should be taken to proceed with the Quarantine Station, the Directors were quite willing to take up the matter again with the Empire Marketing Board.

Mr Thomas Elder of Stevenson said he understood that the Empire Marketing Board was still prepared to go on with the Quarantine Station if they got support from the Pedigree Breed Societies. There seemed to be a wet blanket thrown over the affair on account of the little support that had been given to the London Station. It would be very interesting to know what support was given from Scotland to the London Station. It was not a question that the Society could press too much until it was known what the Dominions were prepared to do, but he hoped the proposed Station at Glasgow would not be lost sight of. Scotland had remained free of disease for some years, and the Dominions were quite as safe without any Station in Scotland as they were in England.

Agricultural Education.

Colonel F. J. Carruthers, Convener of the Education Committee, reported as follows :—

I have to submit the following report on the Examination held at Leeds in April for the National Diploma in Agriculture. 148 candidates presented themselves for examination; 33 candidates were from Scotland. As a result of the examination 50 Diplomas were awarded, 2 with Honours. Of the 148 candidates, 10 appeared for all subjects, and of these 6 passed. 68 had passed certain subjects previously, and were completing the examination this year, and of these 44 obtained the Diploma. The remaining 70 presented themselves for groups of three, four, or five subjects, and of these 43 passed in the subjects for which they appeared, and are therefore entitled to appear for the remaining subjects in 1930 or 1931.

Report by Chemist.

Dr J. F. Tocher, Consulting Chemist to the Society, submitted a report on the work done in that department during the past half-year. The substance of Dr Tocher's report appears on pp. 211-216 of this volume.

Vote of Thanks to Chairman.

Mr James M'Laren moved a cordial vote of thanks to Mr J. E. Kerr for presiding at the Meeting.

GENERAL MEETING OF MEMBERS HELD IN THE SHOWYARD,
ALLOA, 24TH JULY 1929.

The EARL OF MAR AND KELLIE, K.T., President of the Society,
in the chair.

The Chairman said he was proud that the ninety-eighth Show of the Highland and Agricultural Society should be held in his ground. It occupied a position practically in the centre of Scotland. At any rate, for this week the wee County, as it was sometimes called, was the hub of agricultural Scotland. The Society was, of course, over one hundred years old, but the Show had not reached its centenary owing to the war and other vicissitudes, which prevented the holding of a Show in some years. The Society, however, was getting near its hundredth Show, and instead of becoming senile, as they might expect, it was becoming more lively and vigorous every year, as, he thought, was shown by the proceedings at the annual meeting earlier in the year in Edinburgh, which proceedings it would take him a good long time to forget.

When they saw the quality and number of the stock and the beautiful implements in the showyard, it was difficult to think that Scottish agriculture should be in a languishing condition. But undoubtedly it was going through difficult times. As they all knew, prosperity in farming depended on two things—prices and the weather. Sometimes one balanced the other. When both were bad, the British farmer had a pretty thin time. The fact was that from a British farmer's point of view there was far too much wheat and corn grown in Canada and the north-west States of America, leading to over-production, and when they heard of droughty conditions in these regions they could not be expected to shed many tears. However, they seemed to get along somehow. All they asked was that they should not be subjected to experimental legislation. But they were grateful for the De-rating Act, which appeared to be a dying effort of the last Government. He welcomed the overseas visitors, who, he understood, were there that day, and he hoped they came with full purses, prepared to empty them in the showyard.

His Lordship said he would like, before concluding, to make a reference to His Majesty the King, who had been through such a prolonged and dangerous illness. His Majesty was not an exhibitor in that yard, but he often had been an exhibitor and patronised the Highland Show. The King took a great interest in it. They all regretted—as he knew His Majesty regretted—that he had to forgo for this year his autumn holiday in Scotland, and he was sure they all hoped that now he would make a speedy recovery to his usual health.

Another allusion he wished to make was to the late Lord Rosebery, who was for over sixty years a member of the Society. A noted breeder of pedigree stock, exhibiting at all the Shows of the Society, he was Vice-President for many years and President from 1915 to 1919. He always took a great interest in the Society, and his loss would be very difficult to replace.

In closing, his Lordship said he thanked the Society for having made him their President during that year, and he hoped it was not simply because he happened to be the owner of the ground and Lord-Lieutenant of the county. He assured them he took the greatest possible interest in agriculture as a whole, although he was not himself a breeder of stock, and the success of that Show came near to his heart.

Votes of Thanks.

Mr James M'Laren, Cornton, Bridge of Allan, Chairman of Directors, said it was with great pleasure he moved: "That a cordial vote of thanks be accorded to the Provost, Magistrates, and Town Council of Alloa for their cordial co-operation and assistance in all matters tending to promote the success of the Show." The town of Alloa, he said, was fortunate indeed in having such a generous and kind-hearted landlord as Lord Mar in their midst, and he had no hesitation in saying that that field they were on that day was one of the finest sites the Society had had for their Show. The Town Council deserved great credit for the way in which they had helped in every shape and form, and also for the supply of water they had freely given. At the same time, he might say that the holding of the Show there in that beautiful spot was one of the best advertisements the town of Alloa ever had.

Mr John Elliot, Balmakiel, Galashiels, in seconding, said they were all delighted to come to such a beautiful countryside, and would take away very happy memories indeed.

The vote of thanks was heartily accorded.

Provost Moir, in reply, said that that was a very unique time for Alloa. Some of them thought they were in the limelight before, but the Highland Show had actually got them in the limelight now. The name of Alloa was to be found in large letters in every paper in Scotland, and possibly some benighted people who did not know where Alloa was before knew where it was now. The fact that the Show had come to Alloa was just one of those little romances that made life interesting. Often they were told they got chances that never recurred. For instance, they might put their money in gramophones and wake up wealthy men, or they might back the winner of a big race and win wealth. In Alloa they got a chance, and it was given to them by their good friend, Mr John Prentice, Craigrie. Mr Prentice called upon him a year ago and said it was up to him (Provost Moir) to get the Highland Show to Alloa. He (Provost Moir) did not think there was the slightest chance of the Society being tempted to bring the Show to Alloa, because at that time it appeared to him the Highland Society was in the position of a very attractive lady with a great many suitors who had everything to tempt her to come to them, and they—poor Alloa—had practically nothing. But Mr Prentice assured him that they were much better-looking than they thought, and that if they went forward, in all probability they would succeed. Before they could go forward they had to consult their godfather, and, luckily for them, their godfather was the Earl of Mar and Kellie. Lord Mar asked if he thought it would be a good thing for Alloa, and he answered unhesitatingly in the affirmative, but he had, as Lord Mar's factor, to point out that it might be an infernal nuisance to them to have a Show like that practically in the middle of the pleasure ground, especially if the weather should be wet. His Lordship replied that he was perfectly prepared to take that risk, and he made it clear that he did not want to make any profit out of the transaction. Fortified with that as a marriage settlement, they went forward quite gaily and defeated all competitors. Their one regret now was that the bride would be leaving them so early, probably going to a dull place like Dumfries. But they expressed the hope that when Central Scotland came to be visited again, the Society would not forget Alloa, and he could assure them that Alloa would give them as hearty a welcome then as they did now.

Colonel F. J. Carruthers, Dormont, Lockerbie, proposed a vote of thanks to Mr J. Ernest Kerr of Harviestoun, Convener, and the members of the Local Committee for the efficient and successful manner in which they had carried out the arrangements for the Show. He said Mr Kerr had for many years now carried out the somewhat heavy and responsible duties of steward of cattle at their annual Show, and in undertaking the Chairmanship of the Local Committee he was only adding one more to the many acts of kindness for which the Society was indebted to him. The duties of the attending members on the judges—the principal work of the Local Committee—had been carried out with great efficiency and promptitude. In some cases they had been a little bit arduous. There was one lot of attending members who had not finished till nearly seven o'clock on the previous evening. But whether their duties were light or heavy they had been performed most faithfully, and thanks were due to all of them for coming forward to do what was very necessary work.

Mr A. A. Hagart Spiers of Elderslie, who seconded, said he would like to add his tribute to the way in which the members of the Local Committee, as attending members, had worked. As to the arrangements, he said he congratulated them in having made a most successful job of a very good place.

Mr J. Ernest Kerr, in replying, said he was sure that everything the Local Committee had done had been a labour of love. If the weather only held on as it was doing, they should have a most successful Show.

Mr Alexander Munro, Leanach, Inverness, moved that the Society express its appreciation of the satisfactory arrangements made by the Railway Companies for the expeditious transport of all stock and implements connected with the Show. He was pleased to hear that the companies had not, up till now, received one single complaint. He understood they ran some hundreds of trains direct from Harrogate to the Show at Alloa. It had been done through the same officials as had charge of the work at Harrogate, and he thought that went a long way to help matters at Alloa. In very few cases was stock late for the Show. There was nothing said in that motion about the way the companies had catered for passenger traffic. He thought that the amalgamation of the bus traffic and that of the railway companies would be an excellent thing for that and future Shows of the Society. Indeed, as far as he knew, the railway companies had done so

well there, that he thought they could even have made the centenary Show a success in Inverness.

Mr N. H. Constable, Bute Estates Office, Rothesay, in seconding the resolution, said that while the railways were nowadays to a considerable extent superseded by motor transport, nevertheless for a Show such as that the railway companies still had a vast amount of traffic to cope with. The success of the Show was due in large measure to the efficient and careful manner in which that traffic was handled.

Major Stemp, Superintendent of the Southern Scottish Division, London & North-Eastern Railway Company, replying on behalf of his own Company and the London, Midland & Scottish Railway Company, said they greatly appreciated the vote of thanks. It was refreshing nowadays to hear good things said about the railways at all. As a rule it was their shortcomings that were talked about. The London & North-Eastern Railway Company had landed at the showyard something approaching 900 waggons of exhibits, implements, and stock, and they had been brought in to time, and in the majority of instances before time. Similar work had been done by the London, Midland & Scottish Railway Company. The handling of the traffic for a Show like that was not a matter that could be undertaken without many hours of close examination of what had to be done and planning for it, because if he might say so, the Highland and Agricultural Society expected a high standard from the railways, and were not slow to say so if they did not get it. As a rule the companies tried to come up to requirements. The handling of the Show traffic was, of course, particularly difficult in the height of the season when the ordinary traffic, both passenger and freight, was at its heaviest. They sometimes heard it said that the railway companies were down and out, but that was not the case. They were not down and out at all. To handle the traffic of a Show such as that, he was just wondering what they would do without the railways. No road transport could have dealt with such heavy traffic as that from Harrogate in the time taken by the railways.

Major Stemp added that railheads had recently been established for motor traffic to various farms in the neighbourhood, and also for collecting, but the railway companies found that, while they got manure and other such commodities which the road haulage people would not take, it was the road transport firms who invariably got the grain, flour, and oil-cake to carry. The railways were not afraid of competition—it had done them a world of good of late years,—but what they wanted was fair competition. Probably some of the competition would die out when the amalgamation with the road transport people took place. Whether that would be an advantage to the trader was open to question. Concluding, he said it was the object of the railway companies to do their best, not alone for the Highland and Agricultural Society, but for traders in every branch of business. He thought that, taking everything into consideration, bearing in mind the conditions that operated to-day, perhaps they did not fall so far short of their undertakings after all.

Vote of Thanks to Chairman.

Mr Alexander Murdoch, C.A., East Hallside, in moving a vote of thanks to the Chairman, said they had had a very successful and harmonious meeting, and that was in no small measure due to the way in which their Chairman had conducted the business. They all remembered the efficient way he conducted the meeting on another occasion when it was most difficult to handle. The Chairman of Directors had referred to the field in which the Show was held as one of the finest fields the Society had ever had. He (Mr Murdoch) thought it was the finest field the Society had ever had, and they were indebted to Lord Mar for giving them that field and for the live interest he had taken in the affairs of the Society during his year of office.

The Chairman briefly acknowledged, and the proceedings then terminated.

ANNIVERSARY GENERAL MEETING, 8TH JANUARY 1930.

The DUKE OF BUCCLEUCH AND QUEENSBERRY, K.T., President of the Society, in the Chair.

New Members.

One hundred and fifty-four candidates for election were balloted for and admitted members of the Society.

Vacancies on Board.

Mr J. E. Kerr of Harviestoun, Dollar, Chairman of Directors, moved the following recommendation of the Board of Directors: That Mr Ian M. Campbell, Tighnamara, Dornoch, be elected an Ordinary Director of the Society for the Inverness Show Division, to fill the vacancy caused by the retirement of Lieut.-Colonel T. W. Cuthbert, C.M.G., D.S.O.

The recommendation was unanimously adopted.

Finance.

Mr J. E. Kerr submitted the Accounts of the Society for the year to 30th November 1929. The receipts for the year from all sources reached a total of £27,083, 5s. 4d. This sum exceeded the outlays by £1643, 12s. 3d. Annual subscriptions amounted to £2489, 6s. 6d., and life subscriptions to £789, 12s. In the past year the expenditure on educational work amounted to £357, 7s. 1d.; on the work in the chemical and veterinary departments, £458, 0s. 10d.; and on the Society's 'Transactions,' £1710, 9s. Special grants were given amounting to £440; premiums and medals for local shows and district competitions, £581, 10s. 9d.; and certificates and medals for long service, £110, 10s. 2d.

He moved approval of the following special grants: to the Hannah Dairy Research Institute, £500 towards the provision of equipment for the Institute's Laboratories and Library, and £1000 towards an Endowment Fund; £100 for the current year to the Scottish Agricultural Organisation Society; and £10 to the Scottish Society for the Prevention of Cruelty to Animals.

Mr James M'Queen of Crofts, Dalbeattie, seconded, and the accounts and special grants were approved.

Argyll Naval Fund.

Mr James M'Laren, Cornton, Bridge of Allan, submitted the report on the Argyll Naval Fund for 1928-29, which showed that the income for the year amounted to £331, 13s. 6d., while the expenditure was £320, comprising grants of £40 each to eight naval cadets.

Alloa Show, 1929.

Mr James R. Lumsden of Arden reported on the Show held at Alloa on Tuesday, 23rd July, and three following days. For substance of the report see p. 269 of this volume.

Dumfries Show, 1930.

Mr R. Macmillan, of Holm of Dalquhain, Woodlea, Moniaive, Convener of the Shows Committee, reported as follows:—

Arrangements are well advanced for the Show to be held this year at Dumfries. The date of the Show has been fixed for the 22nd to the 25th July, inclusive. As previously reported, an excellent site has again been secured at Rotchell Park. This comprises the ground on which the Shows of 1910 and 1922 were held, together with considerable additional space. The site is conveniently situated, sufficient in extent, and readily accessible. The Town Council of Dumfries has offered a free supply of water, gas, and electric power, together with a donation of £100 to the Show funds. The Prize List, which is at present in course of preparation, will be on the usual liberal scale, the amount to be offered in prizes

from the Society's own funds reaching a total of £3877, compared with £3293 at the last Dumfries Show in 1922. In addition, there are the usual large number of valuable Challenge Cups, Medals, and Special Prizes, besides prize money contributed by Breed Societies and private donors.

Edinburgh Show, 1931.

Dr T. G. Nasmyth, Canaan Lodge, 43 Canaan Lane, Edinburgh, reported that arrangements were in progress for the Hundredth Show to be held at Edinburgh in 1931. As already reported, the Corporation of Edinburgh had placed at the disposal of the Society an excellent site at Saughton Park, and had further decided to give a grant of £500 to the Show funds and to offer a Gold Cup for competition at the Show. A representative Committee had been appointed to consider the special features and special arrangements for the Show, and the Directors hoped to be in a position to submit a general outline of the proposed arrangements at the next half-yearly meeting in June.

Show of 1932.

Mr Alexander Munro of Leanach, Inverness, moved the following resolution, which had that day been adopted by the Board of Directors: "That, provided a suitable site is available, and satisfactory financial and other arrangements can be made, the Society's Show of 1932 be held in the Inverness Show Division." He said that the people in the North had not only a short memory but a forgiving one. Every agriculturist in the North would do everything possible to make the Show a success.

Provost A. M. MacEwen, Inverness, seconding, said he cordially endorsed what Mr Munro had said. If there was any hesitation on the part of those in the North in welcoming the idea of the Show in 1932, it was perhaps owing to the feeling that a Show in 1932 might experience some reaction after the great event of the Hundredth Show in the previous year. He could assure the members of the Society that so far as they in Inverness and the North were concerned, it would be no fault of theirs if the Show of 1932 was not a success. They would give it the most cordial welcome in their power and do everything they could to make it a success.

The motion was unanimously adopted.

Grants to Local Societies.

Mr Alexander Murdoch, East Hallside, Hallside, Lanarkshire, submitted the report on District Shows and Competitions, showing that in 1929 grants of money and medals had been given in 72 districts. The total expenditure under this head amounted to £775, 5s. 8d. For the current year the Directors proposed the following grants: 22 districts for grants of £12 each for cattle, horses, and sheep, and 11 districts in intermediate years, with a grant of three silver medals to each; 9 districts for grants of £15 each for stallions; 2 districts for grants of £3 each; special grants of £10 each to 8 Federations of Scottish Women's Rural Institutes; £20 to Kilmarnock Cheese Show; £20 to Northern Arts and Crafts Society; a gold medal and silver medal to the British Dairymaids' Association; three silver medals for Sir John Fleming Cup Stackyard Competition; 6 districts for two medals each; £8 and eight silver medals to the Scottish National Union of Allotment Holders; 1 district for grant of £3 for cottages and gardens; 3 districts for one medal each for cottages, gardens, garden produce, &c.; long service certificates and medals, say £185, and the usual medals for ploughing and hoeing competitions, say £127, 8s. 9d., making the total sum offered in 1930 £903, 10s. 9d.

Education.

Colonel F. J. Carruthers of Dormont, Lockerbie, Convenor of the Education Committee, reported on the results of the thirty-fourth examination held during September last for the National Diploma in Dairying, under the new National Dairy Examination Board (comprising representatives from the Royal Agricultural Society of England, the Highland and Agricultural Society of Scotland, and the British Dairy Farmers' Association). At the examination in England there were 46 candidates, of whom 30 obtained the Diploma and 16 failed; at

the examination in Kilmarnock there were 51 candidates, 23 obtaining the Diploma and 28 failing. No Diploma with Honours was awarded at either centre. The names of the successful candidates, as well as the names of the winners of the National Diploma in Agriculture at the examination held last April, appear in the Appendix to this volume, pages 21 and 38.

Science.

Report by Chemist.

Dr J. F. Tocher, Consulting Chemist to the Society, reported on the work of the department during the year 1920.

The substance of Dr Tocher's report appears on pp. 211-216 of this volume.

Dr Tocher also referred to a recent visit he had paid to South Africa, and gave a brief account of agricultural conditions as he saw them there.

Society's New Premises.

Mr Archibald MacNeilage, Glasgow, raised a question regarding the new premises of the Society, and put three questions on the subject. The first was: Where was Eglinton Crescent? The second was: In what respect did the premises in Eglinton Crescent differ from the premises there? And the third was: When were they likely to move into those new premises? He was old enough, he added, to remember that when the Chairman's grandfather was President in 1878 there was a proposal then to transfer the headquarters of the Highland Society from these premises, but it never matured on account of the agricultural depression, which everybody knew began with a vengeance in 1879. Now they were at the beginning apparently of another period of agricultural depression, and he hoped this effort to sit on the part of the Highland Society would mature.

Colonel F. J. Carruthers said that Eglinton Crescent was not very far from Haymarket Station. The question of removal had been considered by the Directors for a considerable time. The room in which they were met that day was not a very comfortable room, and the staff was badly accommodated in the premises. The new building would be found much more suitable than their present premises. The Eglinton premises were ready for occupation, except for the furniture. They could not complete the arrangements for the furnishings until they knew what was going to happen to the old premises. The George IV. Bridge premises had been valued and advertised for sale, but so far they had not got an offer amounting to the valuation which their valuer put upon them. They expected to move from George IV. Bridge next month, and they would be in occupation at Eglinton Crescent by the March Board meeting. They would have a library there, in which the books would be housed, so that they could be readily available.

Mr J. Milne Henderson, Edinburgh, said it was fifty-one years since he mounted the stairs to come to the General Meeting. He congratulated the Directors upon going to premises in Eglinton Crescent, and said they had made an excellent investment. It was curious how history repeated itself. In 1879 the question of the Inverness Show was debated very keenly. The Marquis of Lothian was in the chair, and Lord Lovat took a very keen interest in the proceedings. It was certainly the longest meeting he had ever attended. He was delighted that Inverness was satisfied on this occasion.

Vote of Thanks.

Mr John Elliot, Balnakiel, Galashiels, said he had a very pleasant duty to perform, and that was to propose a vote of thanks to their noble Chairman, the President. No man in all the country to which he belonged was so beloved as His Grace the Duke of Buccleuch, and no wonder, if they knew the estates as he knew them—the way they were managed, and all the duties falling to His Grace were performed in the same manner. He had much pleasure in moving a vote of thanks to their noble Chairman.

The President, in returning thanks, said it was a good many years since he was last President (Hawick Show, 1914). The last Show at Dumfries had not been signalled by excessive drought. He hoped they would not have to wade through the ground on this occasion. A hearty welcome would be given to everybody at the Show.

APPENDIX

PREMIUMS

OFFERED BY

THE HIGHLAND AND AGRICULTURAL SOCIETY OF SCOTLAND IN 1930

CONTENTS.

	PAGE
GENERAL NOTICE	3
CONSTITUTION AND MANAGEMENT	3
PRIVILEGES OF MEMBERS	4
ESTABLISHMENT FOR 1929-1930	5
COMMITTEES FOR 1929-1930	7
MEETINGS FOR 1930 and 1931	13
EXAMINATIONS FOR 1930	13
AGRICULTURAL EDUCATION	14
VETERINARY DEPARTMENT	22
FORESTRY DEPARTMENT	23
DAIRY DEPARTMENT	31
CHEMICAL DEPARTMENT	41
BOTANICAL DEPARTMENT	52
ENTOMOLOGICAL DEPARTMENT	54
GENERAL REGULATIONS FOR COMPETITORS	55

CLASS I.—REPORTS.

1. THE SCIENCE AND PRACTICE OF AGRICULTURE—FOR APPROVED REPORTS ON—

1. Rural Economy abroad susceptible of being introduced into
Scotland 56
2. Other suitable subjects 56

2. ESTATE IMPROVEMENTS—FOR APPROVED REPORTS ON—

1. General Improvement of Estates by Proprietors 56
- 2, 3, and 4. Reclamation of Waste Land by Proprietors or
Tenants 56
- 5 and 6. Improvement of Natural Pasture by Proprietors or
Tenants 57

3. HIGHLAND INDUSTRIES AND FISHERIES—FOR APPROVED REPORTS ON—

1. Mode of treating Native Wool 57

4. MACHINERY—FOR APPROVED REPORTS 57

5. FORESTRY DEPARTMENT—FOR APPROVED REPORTS ON—

- | | |
|-----------------------------------|----|
| 1. Planting on Peat-bog | 57 |
|-----------------------------------|----|

CLASS II.—DISTRICT COMPETITIONS.

- | | |
|---|----|
| 1. GRANTS TO LOCAL SOCIETIES | 58 |
| 2. GRANTS TO HORSE ASSOCIATIONS | 62 |
| 3. MEDALS in aid of Premiums given by Local Societies | 64 |
| 4. SPECIAL GRANTS | 65 |
| 5. GRANTS TO SCOTTISH WOMEN'S RURAL INSTITUTES | 66 |

CLASS III.—COTTAGES AND GARDENS.

- | | |
|--|----|
| 1. PREMIUMS for BEST KEPT COTTAGES and GARDENS | 67 |
| 2. MEDALS for COTTAGES and GARDENS, or GARDEN PRODUCE,
POULTRY, and BEE-KEEPING | 68 |

CLASS IV.—PLOUGHING, HOEING, AND LONG SERVICE.

- | | |
|---|----|
| 1. PLOUGHING COMPETITIONS | 69 |
| 2. HOEING COMPETITIONS | 70 |
| 3. LONG SERVICE CERTIFICATES AND MEDALS | 71 |

- | | |
|--|----|
| GENERAL SHOW AT DUMFRIES IN 1930 | 73 |
|--|----|

GENERAL NOTICE.

THE HIGHLAND SOCIETY was instituted in the year 1784, and incorporated by Royal Charter in 1787. Its operation was at first limited to matters connected with the improvement of the Highlands of Scotland; but the supervision of certain departments, proper to that part of the country, having been subsequently committed to special Boards of Management, several of the earlier objects contemplated by the Society were abandoned, while the progress of agriculture led to the adoption of others of a more general character. The exertions of the Society were thus early extended to the whole of Scotland, and have since been continuously directed to the promotion of the science and practice of agriculture in all its branches.

In accordance with this more enlarged sphere of action, the original title of the Society was altered, under a Royal Charter, in 1834, to THE HIGHLAND AND AGRICULTURAL SOCIETY OF SCOTLAND.

Among the more important measures which have been effected by the Society are—

1. Agricultural Meetings and General Shows of Stock, Implements, &c., held in the principal towns of Scotland, at which exhibitors from all parts of the United Kingdom are allowed to compete.

2. A system of District Shows instituted for the purpose of improving the breeds of Stock most suitable for different parts of the country, and of aiding and directing the efforts of Local Agricultural Associations.

3. The encouragement of Agricultural Education, under powers conferred by a supplementary Royal Charter, granted in 1856, and authorising the Society to grant Diplomas to Students of Agriculture; and by giving grants in aid of education in Agriculture and allied sciences. In 1900 the Society discontinued its own Examination, and instituted jointly with the Royal Agricultural Society of England an Examination for a National Diploma in Agriculture.

4. The advancement of the Veterinary Art, by conferring Certificates on Students who have passed through a prescribed curriculum, and who are found, by public examination, qualified to practise. Terminated in 1881 in accordance with arrangements with the Royal College of Veterinary Surgeons.

5. The institution of a National Examination in Dairying, jointly with the Royal Agricultural Society of England and the British Dairy Farmers' Association.

6. The institution of an Examination in Forestry for First and Second Class Certificates.

7. The appointment of a chemist for the purpose of promoting the application of science to agriculture.

8. The establishment of a Botanical Department.

9. The appointment of Entomologist to advise members regarding insect pests.

10. The annual publication of the 'Transactions,' comprehending papers by selected writers, Prize Reports, and reports of experiments, also an abstract of the business at Board and General Meetings, and other communications.

11. The management of a fund left by John, 5th Duke of Argyll (the original President of the Society), to assist young natives of the Highlands who enter His Majesty's Navy.

CONSTITUTION AND MANAGEMENT.

The general business of THE HIGHLAND AND AGRICULTURAL SOCIETY is conducted under the sanction and control of the Royal Charters, referred to above, which authorise the enactment of Bye-Laws.

The Office-Bearers consist of a President, Four Vice-Presidents, Thirty-two Ordinary and Twenty Extraordinary Directors, a Treasurer, an Honorary and an Acting Secretary, an Auditor, and other Officers.

The Supplementary Charter of 1856 provides for the appointment of a Council on Education, consisting of Sixteen Members—Nine nominated by the Charter and Seven elected by the Society.

PRIVILEGES OF MEMBERS

MEMBERS OF THE SOCIETY ARE ENTITLED—

1. To receive a free copy of the 'Transactions' annually.
2. To apply for District Premiums that may be offered.
3. To report Ploughing Matches for Medals that may be offered.
4. To Free Admission to the Shows of the Society.
5. To exhibit Live Stock and Implements at reduced rates.¹
6. To have Manures and Feeding-Stuffs analysed at reduced fees.
7. To have Seeds tested at reduced fees.
8. To have Insect Pests and Diseases affecting Farm Crops inquired into.
9. To attend and vote at General Meetings of the Society.
10. To vote for the Election of Directors, &c., &c.

ANALYSIS OF MANURES AND FEEDING-STUFFS

The Fees of the Society's Chemist for Analyses made for Members of the Society shall, until further notice, be as follows:—

This scale of fees applies only to Members whose subscriptions are not in arrears.

The determination of one ingredient in a single sample of manure or of a feeding-stuff . . . 5s.
The determination of two or more ingredients in a single sample of manure or of a feeding-stuff . . . 10s.

These charges apply only to analyses made for agricultural purposes and for the sole and private use of Members of the Highland and Agricultural Society who are not engaged in the manufacture or sale of the substances analysed.

The Society's Chemist, if requested, also supplies valuations of manures, according to the Society's scale of units.

SEEDS, CROP DISEASES, INSECT PESTS, &c.

The rates of charges for the examination of plants and seeds, crop diseases, insect pests, &c., will be had on application to the Secretary.

ELECTION OF MEMBERS

Candidates for admission to the Society must be proposed by a Member, and are elected at the half-yearly General Meetings in January and June. It is not necessary that the proposer should attend the Meeting.

CONDITIONS OF MEMBERSHIP

Higher Subscription.—The ordinary annual subscription is £1, 3s. 6d., and the ordinary subscription for life-membership is £12, 12s.; or after ten annual payments have been made, £7, 7s.

Lower Subscription.—Proprietors farming the whole of their own lands, whose rental on the Valuation Roll does not exceed £500 per annum, and all Tenant Farmers, Se retaries or Treasurers of Local Agricultural Associations, Factors resident on Estates, Land Stewards, Foresters, Agricultural Implement Makers, and Veterinary Surgeons, none of them being also owners of land to an extent exceeding £500 per annum, and such other persons as, in respect of their official or other connection with Agriculture, the Board of Directors may consider eligible, are admitted on a subscription of 10s. annually, which may be redeemed by one payment of £7, 7s., and after eight annual payments of 10s. have been made, a Life Subscription may be purchased for £5, 5s., and after twelve such payments, for £3, 3s.² Subscriptions are payable on election, and afterwards annually in January.

According to the Charter, a Member who shall not have objected to his election, on the same being intimated to him by the Secretary, cannot retire until he has paid, in annual subscriptions or otherwise, an amount equivalent to a life composition.

Members are requested to send to the Secretary the names and addresses of Candidates they have to propose (stating whether the Candidates should be on the £1, 3s. 6d. or 10s. list).

JOHN STIRTON, *Secretary.*

8 EGLINTON CRESCENT, EDINBURGH.

¹ Firms are not admitted as Members; but if one partner of a firm becomes a Member, the firm is allowed to exhibit at Members' rates.

² Candidates claiming to be on the 10s. list must state under which of the above designations they are entitled to be placed.

ESTABLISHMENT FOR 1929-1930.

President.

The DUKE OF BUCLEUGH AND QUEENSBERRY, K.T., Drumlanrig Castle, Thornhill, Dumfriesshire.

Vice-Presidents.

The EARL OF SAIR, D.S.O., Lochinch, Castle Kennedy.

Sir HERBERT E. MAXWELL of Monreith, Bart., D.C.L., LL.D., F.R.S., Whauphill.

W. J. H. MAXWELL of Munches, Dalbeattie.

Sir JOHN WILLIAM BUCHANAN-JARDINE, Bart. of Castlemilk, Lockerbie.

Year of
Election.

Ordinary Directors.

	JAMES M'QUEEN of Crofts, Dalbeattie.
	ALEXANDER MUNRO of Leanach, Culloden Moor, Inverness.
	ALEXANDER NIVEN, Ford, Westfield, Berwick-on-Tweed.
1926	NORMAN H. CONSTABLE, Bute Estate Office, Rothcay.
	J. P. ROSS TAYLOR, Mungoswalls, Duns (elected 4th January 1928).
	PHIPPS O. TURNBULL, Smeaton, Dalkeith.
	JAMES DURNO, Crichtie, Inverurie.
	Brig.-General ARCHIBALD STIRLING of Keir, Dunblane.
	IAN MACGREGOR CAMPBELL, Tighnamara, Dornoch (elected 8th January 1930).
	WILLIAM MEIKLEM, Bennoch Park, Kirkcaldy.
1927	The Hon. WALTER T. H. SCOTT, Master of Polwarth, Harden, Hawick.
	Sir JAMES INGLIS DAVIDSON, Saughton Mains, Corstorphine.
	GEORGE GRANT, Glenfarclas, Blacksoat.
	JOHN W. PRENTICE, Craigrie Farm, Clackmannan.
	JAMES M'CLEAN, Craigmount, Portpatrick.
	ARCHIBALD WHITE, Spott, Kirriemuir.
1928	ALEXANDER MURDOCH, East Hallside, Hallside, Lanarkshire.
	THOMAS TEMPLETON, Sandyknowe, Kelso.
	ROBERT PARK, Brunstane, Portobello.
	Colonel ROBERT W. WALKER, Portlethen, Aberdeen.
	JAMES R. LUMSDEN of Arden, Dumbartonshire.
	J. BRYCE DUNCAN, Newlands, Dumfries (elected 5th June 1929).
	JOHN ROBSON, jun., Lynegar, Watten, Caithness.
	A. A. HAGART SPIERS of Elderslie, Houston House, Houston.
	Major ROBERT W. SHARPE of The Park, Earlstoun.
	THOMAS ELDER of Stevenson, Haddington.
1929	JOHN P. SLEIGH of St John's Wells, Fyvie.
	T. MERCER SHARP, Bardrill, Blackford.
	GEORGE WILL, Crichton Royal, Dumfries.
	JAMES P. BROWN, Dipple, Fochabers.
	The LORD SCONE, Scone Palace, Perth.

Extraordinary Directors.

- 1928 { WILLIAM LOW of Balmakewan, Laurencekirk.
 ROBERT MACMILLAN of Holm of Dalquhairn, Woodlea, Moniaive.
 WILLIAM S. NIVEN, The Loan, Errol.
 JOHN ELLIOT, Balnakiel, Galashiels.
- 1929 { JAMES M'LALEN, Cornton, Bridge of Allan.
 WILLIAM C. HUNTER of Arngask, Glenfarg.
 W. P. GILMOUR, Balmangan, Kirkcudbright.
 Dr T. G. NASMYTH, Canaan Lodge, 43 Canaan Lane, Edinburgh.
 J. ERNEST KERR of Harviestoun, Dollar.
 A. THORNTON HUNTER (Alex. Jack & Sons Ltd.), Maybole.

Shew District.

- 1929 { Major C. R. DUDGEON, Cargen Holm, Dumfries.
 F. N. M. GOURLAY, Kirkland, Tynron, Thornhill, Dumfriesshire.
 JOHN HEWESON, Baltersan, Newton-Stewart.
 MURRAY LITTLE, Summerhill, Annan.
 MATTHEW C. LUSK, Airieland, Castle-Douglas.
 ALEXANDER NEILSON M'CAIG, Challoch, Stannraer.
 CHARLES S. M'KERROW, Boreland of Southwick, Dumfries.
 GEORGE A. MARSHALL, Mansfield, Kirkcudbright.
 Provost D. O'BRIEN, Dumfries.
 CHARLES W. RALSTON, Dabton, Thornhill, Dumfriesshire.

Office-Beaters.

-, *Treasurer.*
 Colonel F. J. CARRUTHERS of Dormont, Lockerbie, *Honorary Secretary.*
 JOHN STIRTON, *Secretary.*
 J. G. YARDLEY, *Chief Clerk.*
 JOHN WATT, *Second Clerk.*
 GEORGE JAMES GREGOR, C.A., 8 York Place, *Auditor.*
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 Professor R. STANFIELD, A.R.S.M., M.Inst.C.E., F.R.S.E., 24 Mayfield
 Gardens, *Consulting Engineer.*
 R. S. MACDOUGALL, M.A., D.Sc., Ivy Lodge, Gullane, *Consulting Entomologist.*
 The Very Rev. CHARLES L. WARR, M.A., 63 Northumberland Street,
Chaplain.
 TODD, MURRAY, & JAMIESON, W.S., 66 Queen Street, *Law Agents.*
 WILLIAM BLACKWOOD & SONS LTD., 45 George Street, *Publishers*
 HENRY MUNRO, LTD., 82 Mitchell Street, Glasgow, *Advertising Agents.*
 HAMILTON & INCHES, Princes Street, *Silversmiths.*
 ALEXANDER KIRKWOOD & SON, 9 St James' Square, *Medallists.*
 JOHN REID, 55 Blenheim Place, Aberdeen, *Showyard Erector.*
 J. P. LAUDER, *Officer and Caretaker.*

Chairman of Board of Directors.

- J. ERNEST KERR of Harviestoun, Dollar.

Chairmen of Committees.

1. *Argyll Naval Fund* . . . MACLACHLAN OF MACLACHLAN, Castle Lachlan, Strachur.
2. *Finance, Chambers, and Law*
3. *Publications* . . . Colonel F. J. CARRUTHERS of Dormont, Lockerbie.
4. *Shows* . . . ROBERT MACMILLAN of Holm of Dalquhairn, Woodlea, Moniaive.
5. *Implements and Machinery* WILLIAM LOW of Balmakewan, Laurencekirk.
6. *Science*
7. *General Purposes* . . J. ERNEST KERR of Harviestoun, Dollar.
8. *Education* . . . Colonel F. J. CARRUTHERS of Dormont, Lockerbie.
9. *Forestry* . . . Sir HUGH SHAW STEWART, Bart., C.B., of Ardgowan, Inverkip.
10. *Office-Bearers* . . . J. ERNEST KERR of Harviestoun, Dollar.

COMMITTEES FOR 1929-1930.

1. ARGYLL NAVAL FUND.

MACLACHLAN OF MACLACHLAN, Castle Lachlan, Strachur, *Convener*.
 The EARL OF ELGIN AND KINCARDINE, C.M.G., Broomhall, Dunfermline.
 Colonel Sir JOHN GILMOUR, Bart., M.P., D.S.O., of Montrave, Leven.
 JAMES M'LAREN, Cornton, Bridge of Allan.
 Sir HUGH SHAW STEWART, Bart., C.B., of Ardgowan, Inverkip.
 Brig.-General ARCHIBALD STIRLING of Keir, Dunblane.
 J. ERNEST KERR of Harviestoun, Dollar, Chairman, *ex officio*.
 Colonel F. J. CARRUTHERS of Dormont, Lockerbie, Hon. Secretary, *ex officio*.

2. FINANCE, CHAMBERS, AND LAW.

....., *Convener*.
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 JAMES DURN, Crichtie, Inverurie.
 JOHN ELLIOT, Balnakiel, Galashiels.
 WILLIAM C. HUNTER of Arngask, Glenfarg.
 J. ERNEST KERR of Harviestoun, Dollar.
 JAMES R. LUMSDEN of Arden, Dumbartonshire.
 JAMES M'LAREN, Cornton, Bridge of Allan.
 ROBERT MACMILLAN of Holm of Dalquhairn, Woodlea, Moniaive.
 JAMES M'QUEEN of Crofts, Dalbeattie.
 ALEXANDER MUNRO of Leanach, Culloden Moor, Inverness.

ALEXANDER MURDOCH, East Hallside, Hallside, Lanarkshire.

PHIPPS O. TURNBULL, Smeaton, Dalkeith.

Colonel F. J. CARRUTHERS of Dormont, Lockerbie, Hon. Secretary,
ex officio.

GEORGE JAMES GREGOR, C.A., Auditor, *ex officio*.

3. PUBLICATIONS.

Colonel F. J. CARRUTHERS of Dormont, Lockerbie, Hon. Secretary,
Convener.

JAMES P. BROWN, Dipple, Fochabers.

NORMAN H. CONSTABLE, Bute Estate Office, Rothesay.

JAMES DURNO, Orichie, Inverurie.

GEORGE GRANT, Glenfarclas, Blacksboat.

WILLIAM C. HUNTER of Arngask, Glenfarg.

WILLIAM LOW of Balmakewan, Laurencekirk.

JAMES R. LUMSDEN of Arden, Dumbartonshire.

JAMES M'LAREN, Cornton, Bridge of Allan.

ROBERT MACMILLAN of Holm of Dalquhairn, Woodlea, Moniaive.

ALEXANDER MURDOCH, East Hallside, Hallside, Lanarkshire.

Dr THOMAS G. NASMYTH, Canaan Lodge, 43 Canaan Lane, Edinburgh.

JOHN ROBSON, jun., Lynegar, Watten, Caithness.

The Hon. WALTER T. H. SCOTT, Master of Polwarth, Harden, Hawick.

Brig.-General ARCHIBALD STIRLING of Keir, Dunblane.

J. P. ROSS TAYLOR, Mungoswalls, Duns.

J. ERNEST KERR of Harviestoun, Dollar, Chairman, *ex officio*.

4. SHOWS.

ROBERT MACMILLAN of Holm of Dalquhairn, Woodlea, Moniaive, *Convener*

ROBERT PARK, Bruanstane, Portobello, *Vice-Convener*.

JAMES P. BROWN, Dipple, Fochabers.

IAN MACGREGOR CAMPBELL, Tighnamara, Dornoch.

NORMAN H. CONSTABLE, Bute Estate Office, Rothesay.

Sir JAMES INGLIS DAVIDSON, Saughton Mains, Corstorphine.

Major C. R. DUDGEON, Cargen Holm, Dumfries.

J. BRYCE DUNCAN, Newlands, Dumfries.

JAMES DURNO, Orichie, Inverurie.

THOMAS ELDER of Stevenson, Haddington.

JOHN ELLIOT, Balnakiel, Galashiels.

W. P. GILMOUR, Balmangan, Kirkcudbright.

F. N. M. GOURLAY, Kirkland, Tynron, Thornhill, Dumfriesshire.

GEORGE GRANT, Glenfarclas, Blacksboat.

JOHN HEWETSON, Balteisan, Newton-Stewart.

A. THORNTON HUNTER (Alex. Jack & Sons Ltd.), Maybole.

WILLIAM C. HUNTER of Arngask, Glenfarg.

J. ERNEST KERR of Harviestoun, Dollar.

MURRAY LITTLE, Summerhill, Annan.

WILLIAM LOW of Balmakewan, Laurencekirk.

JAMES R. LUMSDEN of Arden, Dumbartonshire.

MATTHEW C. LUSK, Airlaid, Castle-Douglas.

ALEXANDER NEILSON M'CAIG, Challock, Stranraer.

JAMES M'CLEAN, Craigmount, Portpatrick.

CHARLES S. M'KERRON, Boreland of Southwick, Dumfries.

JAMES M'LAREN, Cornton, Bridge of Allan.

JAMES M'QUEEN of Crofts, Dalbeattie.

GEORGE A. MARSHALL, Mansefield, Kirkcudbright.

WILLIAM MEIKLE, Bennochy Park, Kirkcaldy.

ALEXANDER MUNRO of Leanach, Culloden Moor, Inverness.
 ALEXANDER MURDOCH, East Hallside, Hallside, Lanarkshire.
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 WILLIAM S. NIVEN, The Loan, Errol.
 Provost D. O'BRIEN, Dumfries.
 JOHN W. PRENTICE, Craigrie Farm, Clackmannan.
 CHARLES W. RALSTON, Dabton, Thornhill, Dumfriesshire.
 JOHN ROBSON, jun., Lynegar, Watten, Caithness.
 The LORD SCONE, Scone Palace, Perth.
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 T. MERCKE SHARP, Bardrill, Blackford.
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 JOHN P. SLEIGH of St John's Wells, Fyvie.
 A. A. HAGART SPIERS of Elderslie, Houston House, Houston.
 Brig.-General ARCHIBALD STIELING of Keir, Dunblane.
 J. P. ROSS TAYLOR, Mungoswalls, Duns.
 THOMAS TEMPLETON, Sandyknowe, Kelso.
 PHIPPS O. TURNBULL, Smeaton, Dalkeith.
 Colonel ROBERT W. WALKER, Portlethen, Aberdeen.
 ARCHIBALD WHYTE, Spott, Kirriemuir.
 GEORGE WILL, Crichton Royal, Dumfries.
 Colonel F. J. CARRUTHERS of Dormont, Lockerbie, Hon. Secretary, *ex officio*.
 Professor R. STANFIELD, 24 Mayfield Gardens, Edinburgh, Engineer, *ex officio*.

5. IMPLEMENTS AND MACHINERY.

WILLIAM LOW of Balmakewan, Laurencekirk, *Convener*.
 PHIPPS O. TURNBULL, Smeaton, Dalkeith, *Vice-Convener*.
 NORMAN H. CONSTABLE, Bute Estate Office, Rothesay.
 THOMAS ELDER of Stevenson, Haddington.
 W. P. GILMOUR, Balmangan, Kirkeudbright.
 A. THORNTON HUNTER (Alex. Jack & Sons Ltd.), Maybole.
 JAMES M'LAREN, Cornton, Bridge of Allan.
 WILLIAM MEIKLE, Bennochy Park, Kirkcaldy.
 ALEXANDER MUNRO of Leanach, Culloden Moor, Inverness.
 WILLIAM S. NIVEN, The Loan, Errol.
 JOHN W. PRENTICE, Craigrie Farm, Clackmannan.
 JOHN ROBSON, jun., Lynegar, Watten, Caithness.
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 JOHN P. SLEIGH of St John's Wells, Fyvie.
 J. P. ROSS TAYLOR, Mungoswalls, Duns.
 Colonel ROBERT W. WALKER, Portlethen, Aberdeen.
 GEORGE WILL, Crichton Royal, Dumfries.
 J. ERNEST KERR of Harviestoun, Dollar, Chairman, *ex officio*.
 Colonel F. J. CARRUTHERS of Dormont, Lockerbie, Hon. Secretary, *ex officio*.
 Professor R. STANFIELD, 24 Mayfield Gardens, Edinburgh, Engineer, *ex officio*.

6. SCIENCE.

....., *Convener*.
 WILLIAM C. HUNTER of Arngask, Glenfarg, *Vice-Convener*.
 Sir JAMES INGLIS DAVIDSON, Saughton Mains, Corstorphine.

J. BRYCE DUNCAN, Newlands, Dumfries.
 JAMES DUBNO, Crichtie, Inverurie.
 W. P. GILMOUR, Balmangan, Kirkcudbright.
 J. ERNEST KERR of Harviestoun, Dollar.
 WILLIAM LOW of Balmakewan, Laurencekirk.
 JAMES R. LUMSDEN of Arden, Dunbartonshire.
 JAMES M'CLEAN, Craigmount, Portpatrick.
 JAMES M'LAREN, Cornton, Bridge of Allan.
 ROBERT MACMILLAN of Holm of Dalquhairn, Woodlea, Moniaive.
 JAMES M'QUEEN of Crofts, Dalbeattie.
 ALEXANDER MUNRO of Leanach, Culloden Moor, Inverness.
 ALEXANDER MURDOCH, East Hallside, Hallside, Lanarkshire.
 Dr THOMAS G. NASMYTH, Canaan Lodge, 43 Canaan Lane, Edinburgh.
 The LORD SCONE, Scone Palace, Perth.
 The Hon. WALTER T. H. SCOTT, Master of Polwarth, Harden, Hawick.
 Major ROBERT W. SHARPE of The Park, Earlstoun.
 A. A. HAGART STEIRNS of Elderslie, Houston House, Houston.
 Brig.-General ARCHIBALD STIRLING of Keir, Dunblane.
 J. P. ROSS TAYLOR, Mungoswells, Duns.
 THOMAS TEMPLETON, Sandyknowe, Kelso.
 PHIPPS O. TURNBULL, Smeaton, Dalkeith.
 ARCHIBALD WHYTE, Spott, Kirriemuir.
 GEORGE WILL, Crichton Royal, Dumfries.
 Colonel F. J. CARRUTHERS of Dormont, Lockerbie, Hon. Secretary,
ex officio.
 Dr J. F. TOCHER, 41½ Union Street, Aberdeen, Chemist, *ex officio*.
 R. S. MACDOUGALL, M.A., D.Sc., Ivy Lodge, Gullane, Entomologist, *ex officio*.

7. GENERAL PURPOSES.

J. ERNEST KERR of Harviestoun, Dollar, Chairman, *Convener*.
 Sir JAMES INGLIS DAVIDSON, Saughton Mains, Corstorphine.
 THOMAS ELDER of Stevenson, Haddington.
 JOHN ELLIOT, Balnakiel, Galashiels.
 WILLIAM C. HUNTER of Arngask, Glenfarg.
 JAMES M'LAREN, Cornton, Bridge of Allan.
 ROBERT MACMILLAN of Holm of Dalquhairn, Woodlea, Moniaive.
 JAMES M'QUEEN of Crofts, Dalbeattie.
 WILLIAM MEIKLEM, Bennochy Park, Kirkcaldy.
 ALEXANDER MURDOCH, East Hallside, Hallside, Lanarkshire.
 Dr THOMAS G. NASMYTH, Canaan Lodge, 43 Canaan Lane, Edinburgh.
 ROBERT PARK, Brunstane, Portobello.
 The Hon. WALTER T. H. SCOTT, Master of Polwarth, Harden, Hawick.
 Major ROBERT W. SHARPE of The Park, Earlstoun.
 PHIPPS O. TURNBULL, Smeaton, Dalkeith.
 Colonel F. J. CARRUTHERS of Dormont, Lockerbie, Hon. Secretary,
ex officio.

8. EDUCATION.

Colonel F. J. CARRUTHERS of Dormont, Lockerbie, Hon. Secretary,
Convener.
 J. ERNEST KERR of Harviestoun, Dollar.
 WILLIAM LOW of Balmakewan, Laurencekirk.
 JAMES M'LAREN, Cornton, Bridge of Allan.
 JOHN STIRTON, *Secretary*, Highland and Agricultural Society.

9. FORESTRY.

Sir HUGH SHAW STEWART, Bart., C.B., of Ardgowan, Inverkip, *Convener*.
The DUKE OF ATHOLL, K.T., G.C.V.O., C.B., D.S.O., Blair Castle, Blair-Atholl.

Sir JAMES INGLIS DAVIDSON, Saughton Mains, Corstorphine.
The EARL OF ELGIN AND KINCARDINE, O.M.G., Broomhall, Dunfermline.
Sir JOHN R. FINDLAY of Aberlour, 3 Rothesay Terrace, Edinburgh.
WALTER STEWART FOTHERINGHAM of Fotheringham and Murthly, Murthly Castle, Perth.

Colonel Sir JOHN GILMOUR, Bart., M.P., D.S.O., of Montrave, Leven.
F. N. M. GOURLAY, Kirkland, Tynron, Thornhill, Dumfriesshire.

The EARL OF HOME, Springhill, Coldstream.

J. H. MILNE HOME, Irvine House, Canonbie.

JAMES R. LUMSDEN of Arden, Dumbartonshire.

A. D. MACDONALD, Dundas Estate Office, South Queensferry.

MACLACHLAN OF MACLACHLAN, Castle Lachlan, Strachur.

J. T. M'LAREN, 7 Park Place, Stirling.

JAMES M'QUEEN of Crofts, Dalbeattie.

Sir HERBERT E. MAXWELL of Monreith, Bart., Whauphill.

Sir JOHN MAXWELL STIRLING MAXWELL of Pollok, Bart., Pollok House, Pollokshaws.

The LORD POLWARTH, Humble House, Humble, East Lothian.

The LORD SCONE, Scone Palace, Perth.

A. A. HAGART SPEIRS of Elderslie, Houston House, Houston.

Major MARK SPOT of Riddell, Lilliesleaf.

The EARL OF STAIR, D.S.O., Lochinch, Castle Kennedy.

Brig.-General ARCHIBALD STIRLING of Keir, Dunblane.

J. ERNEST KERR of Harviestoun, Dollar, Chairman, *ex officio*.

Colonel F. J. CARRUTHERS of Dormont, Lockerbie, Hon. Secretary, *ex officio*.

10. OFFICE-BEARERS.

Constitution: (1) The four Ordinary Directors for the district in which the Show for the year is to be held (with the exception of one retiring next year); (2) one Ordinary Director from each of the other Show districts; and (3) the Chairman of the Board, Treasurer, and Hon. Secretary, *ex officio*.

Edinburgh { Sir JAMES INGLIS DAVIDSON, Saughton Mains, Corstorphine.
ROBERT PARK, Brunstane, Portobello.
THOMAS ELDER of Stevenson, Haddington.

Inverness . JOHN ROBSON, jun., Lynegar, Watten, Caithness.

Perth . . ARCHIBALD WHYTE, Spott, Kirriemuir.

Glasgow . ALEXANDER MURDOCH, East Hallside, Hallside, Lanarkshire.

Borders . The Hon. WALTER T. H. SCOTT, Master of Polwarth, Harden, Hawick.

Aberdeen . GEORGE GRANT, Glenfarclas, Blackshoat.

Stirling . JAMES R. LUMSDEN of Arden, Dumbartonshire.

Dumfries . JAMES M'CLEAN, Craigmount, Portpatrick.

J. ERNEST KERR of Harviestoun, Dollar, Chairman, *ex officio*.

..... Treasurer, *ex officio*.

Colonel F. J. CARRUTHERS of Dormont, Lockerbie, Hon. Secretary, *ex officio*.

REPRESENTATIVES ON OTHER BODIES.

National Agricultural Examination Board and National Dairy Examination Board

Colonel F. J. CARRUTHERS of Dormont, Lockerbie.

J. ERNEST KEAR of Harviestoun, Dollar.

WILLIAM Low of Balmakewan, Laurencekirk.

JAMES M'LABEN, Cornton, Bridge of Allan.

JOHN SPIRTON, *Secretary*, Highland and Agricultural Society.

Edinburgh and East of Scotland College of Agriculture.

JOHN SRIKTON, *Secretary*, Highland and Agricultural Society.

West of Scotland Agricultural College.

Sir HUGH SHAW STEWART, Bart., C.B., of Ardgowan, Inverkip.

Aberdeen and North of Scotland College of Agriculture.

Dr J. F. TOCHER, 41½ Union Street, Aberdeen.

Royal (Dick) Veterinary College.

Dr THOMAS G. NASMYTH, Canaan Lodge, 43 Canaan Lane, Edinburgh.

Glasgow Veterinary College.

ALEXANDER MURDOCH, East Hallside, Hallside, Lanarkshire.

Scottish Milk Records Association.

W. P. GILMOUR, Balmain, Kirkcudbright.

ALEXANDER MUNRO of Leanach, Culloden Moor, Inverness

ALEXANDER MURDOCH, East Hallside, Hallside, Lanarkshire.

Association for the Preservation of Rural Scotland.

The Hon. WALTER T. H. SCOTT, Master of Polwarth, Harden, Hawick.

SCOTTISH PLANT REGISTRATION STATION.

Standing Committee of Management.

JAMES ELDER, Athelstaneford Mains, Drem.

G. KERTRAM SHIELDS, Rosebery Farm, Gorebridge,
Mid-Lothian.

Mid-Lothian.

MEETINGS.

General Meetings.—By the Charter the Society must hold two General Meetings each year, and, under ordinary circumstances, they are held in the months of January and June, for the election of Members and other business. Twenty a quorum.

By a resolution of the General Meeting on 15th January 1879, a General Meeting of Members is held in the Showyard on the occasion of the Annual Show. This year it will be held at Dumfries on the Wednesday of the Show, at an hour to be announced in the programme of the Show.

With reference to motions at General Meetings, Bye-Law No. 10 provides—"That at General Meetings of the Society no motion or proposal (except of mere form or courtesy) shall be submitted or entertained for immediate decision unless notice thereof has been given a week previously to the Board of Directors, without prejudice, however, to the competency of making such motion or proposal to the effect of its being remitted to the Directors for consideration, and thereafter being disposed of at a future General Meeting."

General Show at Dumfries.—22nd, 23rd, 24th, and 25th July.—Entries close for Implements, 5th May; Stock, Poultry, Dairy Produce, &c., 29th May; Rabbits, Honey, and Live Stock Judging Competition, 19th June.

Directors' Meetings.—The Board of Directors meet (except when otherwise arranged) on the first Wednesday of each month from November till June inclusive, at half-past one o'clock p.m., and occasionally as business may require, on a requisition by three Directors to the Secretary, or on intimation by him. Seven a quorum.

Committee Meetings.—Meetings of the various Committees are held as required.

Nomination of Directors.—Meetings of Members, for the purpose of nominating Directors to represent the Show Divisions on the Board for the year 1931-1932, will be held at the places and on the days after mentioned:—

- | | |
|---|---------------------------------|
| 1. Edinburgh, Market Buildings, Gorgie, | Wed., 28th Jan. 1931, at 1. |
| 2. Glasgow, North British Railway Hotel, | Wed., 11th Feb. 1931, at 1. |
| 3. Stirling, Golden Lion Hotel, | Thur., 12th Feb. 1931, at 1.30. |
| 4. Cupar, County Buildings, | Tues., 17th Feb. 1931, at 2. |
| <i>(In 1932 and 1933 the Meetings will be held at Perth; in 1934 at Cupar.)</i> | |
| 5. Border, Railway Hotel, St Boswells, | Thur., 19th Feb. 1931, at 1.30. |
| 6. Aberdeen, Imperial Hotel, | Fri., 27th Feb. 1931, at 2.30. |
| 7. Inverness, Station Hotel, | Tues., 3rd Mar. 1931, at 2. |
| 8. Dumfries, King's Arms Hotel, | Wed., 11th Mar. 1931, at 2.15. |

The nomination of a Proprietor or other Member paying the higher subscription must be made in the 1st, 2th, 4th, and 5th Divisions; and the nomination of a Tenant-Farmer or other Member paying the lower subscription, in the 3rd, 6th, 7th, and 8th Divisions.

Retiring Directors are not eligible for re-election until after the lapse of at least one year.

EXAMINATIONS.

Agriculture.—The Examination for 1930 for the National Diploma in Agriculture will be held at the University, Leeds, on Tuesday, 8th April 1930, and following days. Entries close on 20th February.

Dairying.—The Examination for 1930 for the National Diploma in Dairying will be held at the Dairy School, Kilmarnock: *Written*—On Thursday, Friday, and Saturday, 4th, 5th, and 6th September 1930; *Oral and Practical*—On Monday, 15th September 1930, and following days. Entries close on 2nd August.

Forestry.—The Examination for the Society's Certificates in Forestry will be held at 8 Eglinton Crescent, Edinburgh, in the month of March 1931.

AGRICULTURAL EDUCATION

By a Supplementary Charter under the Great Seal, granted in 1856, the Society is empowered to grant Diplomas.

From 1858 to 1899 the Society held an annual Examination for Certificate and Diploma in Agriculture. In 1872 the Free Life Membership of the Society was granted to winners of the Diploma. In 1884 permission was given to holders of the Diploma to append the letters F.H.A.S. to their names.

In 1898 it was resolved by the Royal Agricultural Society of England and the Highland and Agricultural Society of Scotland to discontinue the independent Examinations in Agriculture held by the two Societies, and to institute in their stead a Joint-Examination for a NATIONAL DIPLOMA IN AGRICULTURE (N.D.A.) This Examination is now conducted under the management of the "National Agricultural Examination Board" appointed by the two Societies. In the year 1903, on the invitation of the two Societies, the Ministry of Agriculture and Fisheries and the Scottish Education Department agreed to appoint a representative from each to act on the Examination Board. Sir Daniel Hall, K.C.B., represents the former, and the late Sir John Struthers, K.C.B., represented the latter body up till 1921, and thereafter continued as a co-opted member of the Board till his death in 1925. In 1921 the Board of Agriculture for Scotland was invited to appoint a representative, and has since that date been represented by Sir Robert B. Greig, M.C., LL.D.

REGULATIONS FOR EXAMINATION IN THE SCIENCE AND PRACTICE OF AGRICULTURE

1. The Societies may hold conjointly, under the management of the National Agricultural Examination Board appointed by them, an Annual Examination in the Science and Practice of Agriculture, at a convenient centre.

2. Candidates who pass the Examination will receive the National Diploma in Agriculture—the Diploma to be distinguished shortly by the letters "N.D.A."

3. The Examination will be conducted by means of written papers and oral examinations.

4. In order to be eligible to sit for the Board's Examination in Agriculture, a candidate must—

(a) Present a certificate from a recognised Agricultural College that his attainments in the subjects of *General Botany, Geology, General Chemistry, Physics, and Mechanics*, as attested by class and other examinations, are, in the opinion of the authorities of the College, such as to justify his admission to the Board's Examination; or

(b) Produce evidence that he has passed the 1st B.Sc. or the Intermediate Examination in Science of a British University; or

(c) Present a Senior Certificate obtained at the Local Examinations of the Universities of Oxford or Cambridge, and produce evidence that he has continued his study of science for at least a year, and has

obtained a certificate in Subject 3 (a) Elementary Chemistry and Physics, (b) Botany of Group H of the Oxford Higher Local Examination, or in Subjects 1, Elementary Chemistry and Physics, and 4, Botany of Group E of the Cambridge Higher Local Examination ; or

(d) Present an Intermediate Leaving Certificate of the Scottish Education Department, and produce evidence that he has continued his studies for at least another year and has obtained the Higher Leaving Certificate in Science (including Chemistry and Botany).

5. In the case of students who satisfy the Board that they have not had the facilities for obtaining the foregoing certificates, the Board will be prepared to consider evidence of equivalent attainment. [Applications under this rule must be lodged *three months* before the date of the annual examination.]

6. *Before sitting for the PRACTICAL AGRICULTURE and FARM MACHINERY AND IMPLEMENTS papers, all candidates must produce evidence of possessing a practical knowledge of Agriculture obtained by residence on a farm for a period or periods (not more than two) covering a complete year of farming operations.*

7. Candidates will have the option of taking the whole of the following nine papers at one time, or of sitting for a group of any three, four, or five in the first year and the remaining subjects (at one examination) within the next two years :—

SUBJECT.	Maximum Marks.	Pass Marks
1. Practical Agriculture (First Paper) . . .	400	240
2. Practical Agriculture (Second Paper) . . .	400	240
3. Farm Machinery and Implements . . .	300	150
4. Land Surveying and Farm Buildings . . .	100	50
5. Agricultural Chemistry . . .	200	100
6. Agricultural Botany . . .	200	100
7. Agricultural Book-keeping . . .	200	100
8. Agricultural Zoology . . .	100	50
9. Veterinary Science and Hygiene . . .	200	100
	<hr/> 2100	<hr/> 1130

NOTE.—Candidates taking the Examination in two groups of subjects are recommended to take Agricultural Chemistry and Agricultural Botany in the first group.

8. A candidate who obtains not less than three-fourths (1575) of the aggregate maximum marks (2100) in the entire Examination will receive the Diploma with Honours, provided that he obtains not less than three-fourths (600) of the maximum marks (800) in the two Practical Agriculture papers.

9. Candidates electing to take the entire Examination at one time and failing in not more than three subjects may appear for these subjects in the following year. Failure in more than three subjects will be regarded as failure in the whole Examination.

10. In the case of candidates electing to take the Examination in two groups—

(a) A candidate appearing for a group of *three* subjects and failing in a single subject may, *in the case of a first group*, appear for that subject along with the second group, or, *in the case of a second group*, in the following year. Failure in more than one subject will be regarded as failure in the group.

(b) A candidate appearing for a group of *four* or more subjects and failing in not more than two subjects may, *in the case of a first group*, appear for these subjects along with the second group, or, *in the case of a second group*, in the following year. Failure in more than two subjects will be regarded as failure in the group.

11. Non-returnable fees must be paid by candidates as follows :—

Entire Examination	Six guineas.
Group of Subjects	Three guineas.
Reappearance for any Subjects	10/6 per Subject.

12. The Board reserve the right to postpone, abandon, or in any way, or at any time, modify an Examination, and also to decline at any stage to admit any particular candidate to the Examination.

The Examination will take place at Leeds University on TUESDAY, 8th APRIL 1930, and following days.

Forms of application for permission to sit at the Examination may be obtained from "The Secretary, Royal Agricultural Society of England, 16 Bedford Square, London, W.C. 1," or from "The Secretary, Highland and Agricultural Society of Scotland, 8 Eglinton Crescent, Edinburgh," and must be returned duly filled up not later than THURSDAY, 20th FEBRUARY 1930, when the Entries will close.

16 BEDFORD SQUARE, LONDON, W.C. 1,
December 1929.

SYLLABUS OF SUBJECTS OF EXAMINATION

PRACTICAL AGRICULTURE.

I.—FIRST PAPER.

1. *British Farming*.—Arable, stock-raising, dairying—Approximate areas covered by the different systems—Typical examples of each—Area in Great Britain under chief crops—Numbers of live stock—The recent history of agriculture—Short summary of agricultural returns.

2. *Climats*.—The effect of climate on farming practice—Rainfall—Temperature—Prevailing winds—Weather forecasts.

3. *Soils*.—The influence of geological formations on the systems of farming—Classification of soils—Character and composition—Suitability for cultivation—Reclamation—Drainage—Irrigation—Warping—Application of lime and marl—Bare fallows—Tillage—Subsoiling—Deep and thorough cultivation.

4. *Manures*.—The manures of the farm—The treatment of farmyard manure—The disposal of liquid manure and sewage—General manures—Special manures—Field trials of manures—The application of manures—Period of application and amounts used per acre—Unexhausted value of manures and feeding-stuffs.

5. *Crops*.—Wheat, barley, oats, rye, beans, peas, potatoes, turnips, swedes, mangolds, forage plants, hops, and other crops—Their adaptation to different soils and climates—Varieties—Selection of seed—Judging seeds—Cultivation, weeds and parasitic plants, best methods of prevention and eradication—Harvesting—Storing—Cost of production—Improvement of crops by selection and hybridising—Field trials—Methods which the farmer may adopt—Selection to resist disease—The principles of rotations—Rotations suitable for different soils and climates—Rotations and the maintenance of fertility—Green manuring—Leguminous crops in rotation—Catch crops—The advantages and disadvantages of rotations—Specialised farming—Management of Orchards.

II.—SECOND PAPER.

6. *Live Stock*.—The different breeds of British live stock—Their origin, characteristics, and comparative merits—Suitability for different districts—Breeding—General principles—Selection—Mating—Crossing—Rearing and general management—Breeding and rearing of horses, cattle, sheep, pigs, and poultry—Rearing colts and raising store stock—The foods of the farm—Their composition and suitability for different classes of stock—Purchased foods—Composition and special value—Rations for different kinds and ages of stock—Cost of producing beef, mutton, pork, and milk—Cost of feeding farm horses.

7. *The disposal of Crops, Produce, and Stock*.—Marketing grain and other crops—Sale of stock—Live weight—Dead weight.

8. *Milk*.—The production and treatment of milk—The manufacture of cheese, butter, &c.—The utilisation of by-products.

9. *Farming Capital*.—Calculations of the stocking and working of arable, stock, and dairy farms—Farm valuations—Rent and taxes.

10. *Labour*.—Organisation of labour—piece-work, time-work—labour costings.

11. *Renting a Farm*.—Indications of condition, productive power, and stock-carrying capacity—Leases—Conditions of occupancy.

N.B.—*It is essential that a candidate know his subject practically, and that he satisfy the Examiner of his familiarity with farm work and management.*

III.—FARM MACHINERY AND IMPLEMENTS.

1. *Power*.—The principle of action, construction, method of working, also care and management of steam engines and boilers, gas, oil and petrol engines and agricultural tractors—Cost and working expenses in connection with the above—Estimation of the brake horse-power of engines—Power derived from water—Measurement of the quantity of water flowing in a stream—General arrangement of water-power plants—Water-wheels—Turbines—Pumps, principle of action and construction—Flow of water through pipes—Hydraulic ram—Windmills.

2. *Agricultural Implements and Machinery*.—The mode of action and the general principles involved in the construction and working of farm implements and machinery—Arrangement of machinery with respect to the power plant—Pulleys and belting—Shafting and bearings—Lubrication—Lifting appliances—Strength and care of chains—Concrete and its use in the construction of simple foundations for engines and machines.

3. *Implements of Cultivation*.—Ploughs—Cultivators—Grubbers—Harrows—Drills—Manure Distributors—Seeding and planting implements.

4. *Implements of Harvesting*.—Mowing and Reaping machines—Rakes—Tedders—Elevators—Potato raisers.

5. *Implements of Transit*.—Carts, waggons, rick lifters, tractors.

6. *Threshing and Food-preparing Machinery*.—Threshing machines, stationary and portable—Screen Winnowers—Hummelers, Chaff cutters—Pulpers—Cake breakers.

7. *Dairy Appliances*.—Milking machines—Cream separators—Churns and other butter-working appliances—Milk delivery cans—Cheese-making utensils—Vats and presses.

N.B.—*Candidates are expected to have had some experience with agricultural machinery and implements under actual working conditions, and to be capable of illustrating their answers, when necessary, by intelligible sketches or diagrams.*

IV.—LAND SURVEYING AND FARM BUILDINGS.

1. The use and adjustment of instruments employed in Surveying and Levelling other than the Theodolite.
2. Land surveying by chain—Plotting from field book, and determination of areas surveyed—The simpler "field problems."
3. Levelling and plotting from field book.
4. A knowledge of the various classes of maps published by the Ordnance Survey Department and their Scales.
5. *Roads and Fences*.—The construction and maintenance of farm roads, fences, and ditches.
6. *Land Drainage*.—Methods of draining; mole and pipe drains; cost of construction and maintenance.
7. *Buildings*.—Buildings required on different classes of farms—Economic arrangement of farm buildings—Materials—Construction—Ventilation—Drainage—Water supply—Dimensions of dairy, stables, cow-sheds, yard, courts, and piggeries—Accommodation for power—Implement, machinery, and cart sheds—Hay and grain sheds—Shelter sheds—Storage of manure.

N.B.—*Each candidate should have with him at the Examination a pair of compasses, scales of equal parts, including scales of one chain to the inch, 4 feet to the inch, 8 feet to the inch, and the scale fitting the Ordnance map, 2500 or 25344 inches to the mile, a small protractor, a set square, and a straight-edge about 18 inches in length.*

V.—AGRICULTURAL CHEMISTRY.

1. *The Atmosphere*.—Its composition and relations to plant and animal life.
2. *Water*.—Rain water—Soil water and drainage—Drinking water—Sewage and irrigation.
3. *The Soil*.—Origin, formation, and classification of soils—Sampling—Analysis—Composition of soils—The chemical and physical properties of soils—The water and air of the soil—Biological changes in the soil—The soil in relation to plant growth—Fertility—Causes of infertility—Improvement of soils.
4. *Manures*.—Theories of manuring—Classification of manures—Origin, nature, and characteristics of manures—Manufacture of manures—Composition, analysis, adulteration, and valuation of manures—Farmyard manure and other natural manures—Green-manuring—Liming, marling, claying—Artificial manures, their origin and manufacture—Fertilisers and Feeding Stuffs Act—Sampling of manures.
5. *Poisons, Antiseptics, and Preservatives*.—General chemical composition and character of insecticides, fungicides, antiseptics, and preservatives used on the farm.
6. *Plants and Crops*.—Constituents of plants—Assimilation and nutrition of plants—Sources of the nitrogen and other constituents of plants—Germination—Action of enzymes—Composition and manurial requirements of farm crops—Food products derived from crops—Manuring experiments.
7. *Animals*.—Composition of animal body—Animal nutrition—Digestion—Assimilation, metabolism, respiration, and excretion.
8. *Foods and Feeding*.—Constituents of foods—Origin, nature, and composition of chief feeding-stuffs—Sampling, analysis, and adulteration of foods—Nutritive value and digestibility of food—Functions of chief

food constituents—Energy values—Vitamines—Relation of foods to the production of work, meat, milk, and manure—Manurial residues of foods.

9. *Dairy Chemistry*.—The composition of milk, cream, butter, cheese, &c.—Conditions which influence the composition of milk and milk products—Action of ferments and enzymes on milk and milk products—Milk-testing—Analysis and adulteration of dairy products.

N.B.—*Candidates are required to bring their Laboratory Notes to the Oral Examination in this subject.*

VI.—AGRICULTURAL BOTANY.

In addition to a *general knowledge* of the morphology, histology, and physiology of plants, candidates will be expected to possess a *detailed knowledge* of the following subjects:—

British grasses of agricultural importance: recognition of, at any stage of growth. Habitats of important species. Constitution of the grass flora of good meadows and pastures. Composition of seed mixtures for temporary and permanent leys on various soils. The effects of artificial manures on the flora of grass land.

The weeds of arable and grass land. Poisonous and parasitic weeds. Methods of distribution by seed and vegetatively: of eradication. Weeds as soil indicators. Recognition of the seeds of the common weeds, particularly those characteristically found in clover, grass, &c., seed.

The chief varieties of wheat, barley, oats, clovers, roots, and other farm crops: their suitability for various climatic and soil conditions. The identification of the more important types of cereals by means of their grain characters. Characteristics of good and bad samples of cereals.

Identification of materials used in feeding cakes and meals.

Plant-breeding. Principles of heredity in plants. Pure lines. Fluctuating variability. Selection.

Disease in plants. Diseases due to the effects of parasitic fungi. Resistance to disease: conditions affecting. Fungoid diseases scheduled from time to time by the Ministry of Agriculture and Fisheries.

Yeasts and fermentation.

The general outlines of bacteriology: nitrogen fixation, nitrification, and denitrification. Putrefaction and the bacteriology of milk, butter, and cheese.

VII.—AGRICULTURAL BOOK-KEEPING.

1. Advantages of book-keeping to the farmer. Difficulties and how they can be overcome. Objects of book-keeping.

2. General principles of book-keeping. Double-entry system. Description and use of various books. Ledger, journal, cash-book, petty cash-book, day-books, &c. Entering transactions; posting; trial balance; closing the accounts. Single-entry system.

3. Special ledger accounts: Interest, depreciation, rent and rates, improvements, private and household expenses, profit and loss, and capital; partnership accounts.

4. Bank business. Opening a bank account. Use of cheques. Deposits and overdrafts.

5. General office work; correspondence, order notes, invoices, rendering accounts, receipts, &c. Filing systems.

6. Farm valuations for book-keeping purposes. Dates for stock-taking and principles of valuation. The farm balance-sheet.

7. Systems of farm book-keeping. Conditions that determine the most suitable system. Advantages and drawbacks of each system.

8. Accounts for the owner-occupier. Treatment of rent. Incidence of rates and tithe in England and Scotland, and their treatment as between farm and estate accounts. Improvements and upkeep and the general principles relating to maintenance claims.

9. Cost accounting. General principles and methods. Advantages, objects, difficulties.

10. Interpretation of results from ordinary and from cost accounts. Precautions necessary. Use of accounts as a guide to efficient management.

11. Income Tax. How the farmer is assessed. Preparation of Income Tax return. Treatment of Income Tax in accounts.

VIII.—AGRICULTURAL ZOOLOGY.

1. The part played by common animals in helping or hindering agricultural operations, as illustrated by moles and voles, insectivorous and other birds, snails and slugs, useful and injurious insects, arachnids and myriapods, earthworms, &c.

2. *General Structure of Insects*, especially the external characters.

3. *Life-history of Insects*.—Economic importance of different stages. A knowledge of the life-history of the principal insect pests as affording a basis for appropriate treatment.

4. *Acarina* injurious to Food Crops and Live Stock.

5. *Parasitic Worms*.—Flukes, Tapeworms, and Threadworms.

6. *Preventive and Remedial Measures* in regard to insects, acarines, and worm parasites—*e.g.*, farm practice in relation to the discouragement of insect attack. Encouragement of insect-eating birds and mammals. Artificial remedies. Insecticides. Treatment for parasites.

N.B.—*Practical acquaintance with common animals, especially insects and worm parasites, will be expected. Where the candidate is not acquainted with the scientific name of an animal, the generally received English name will be accepted.*

Candidates are required to bring their Laboratory Notes to the Oral Examination in this subject.

IX.—VETERINARY SCIENCE AND HYGIENE.

1. Elementary anatomy and physiology of the horse, ox, sheep, and pig, and their relation to unsoundness and disease.

2. The general principles of breeding—including the physiology of reproduction, the laws of heredity, the periods of gestation, and the signs of pregnancy in the mare, cow, ewe, and sow.

3. Dentition as a means of determining the age of horses, cattle, sheep, and swine.

4. The management of farm stock in health and disease.

The following won the Diploma in 1929 :—

Diploma with Honours.

- 1st. ERIC LEONARD JONES, University College of Wales, Aberystwyth.
- 2nd. ANNE CATHERINE ANDERSON, Edinburgh and East of Scotland College of Agriculture.

Diploma.

- WILLIAM JOHN BADCOCK, University of Reading.
 ALAN BUTLER BATES, University of Leeds.
 ROGER JOHN BENSTEAD, East Anglian Institute of Agriculture, Chelmsford.
 JOHN BLACKWALL, Midland Agricultural and Dairy College, Sutton Bonington.
 JAMES AFFLECK BROWN, Jun., West of Scotland Agricultural College, Glasgow.
 ALLAN JAMES BURNS, Glasgow University and West of Scotland Agricultural College.
 ERNEST HOWARD COAK, Seale Hayne Agricultural College, Newton Abbot, Devon.
 JOSEPH BEELEY COLLINGHAM, Midland Agricultural and Dairy College, Sutton Bonington.
 JAMES TERTIUS CRAIG, West of Scotland Agricultural College.
 DONALD SEATON CUMMINS, Seale Hayne Agricultural College, Newton Abbot, Devon.
 CYRIL DANIEL, Seale Hayne Agricultural College, Newton Abbot, Devon.
 DAVID THOMAS DAVIES, University College of Wales, Aberystwyth.
 EVAN DAVIES, University College of Wales, Aberystwyth.
 WALTER DREW, Seale Hayne Agricultural College, Newton Abbot, Devon.
 GEORGE DUNLOP, Glasgow University and West of Scotland Agricultural College.
 JOSEPH EDWARDS, Glasgow University and West of Scotland Agricultural College.
 JOSIAH GUNSTON, East Anglian Institute of Agriculture.
 WILLIAM FREDERICK GWILLIAM, Harper Adams Agricultural College, Newport, Salop.
 BENJAMIN HENRY HARVEY, East Anglian Institute of Agriculture.
 WILLIAM EDWARD HEATH, Midland Agricultural and Dairy College, Sutton Bonington.
 HENRY HIRST, University of Leeds.
 PHILIP ROBERT HENWOOD JOHN, South Eastern Agricultural College, Wye, Kent.
 HOWELL WILLIAM JONES, University College of North Wales, Bangor.
 TIMOTHY EMLYN JONES, University College of Wales, Aberystwyth.
 HUGH DEANS LEIGHTON, West of Scotland Agricultural College.
 ROWLAND LINE, South Eastern Agricultural College, Wye.
 TOM MERCHANT, Seale Hayne Agricultural College, Newton Abbot, Devon.

NIEL RANKIN MORISON, Glasgow University and West of Scotland Agricultural College.

JOHN MORTON, West of Scotland Agricultural College.

WALTER STANLEY RAYFIELD, University of Leeds.

JOHN OWEN ROBERTS, University College of North Wales, Bangor.

HAROLD BENJAMIN SALTER, Seale Hayne Agricultural College, Newton Abbot, Devon.

ALFRED JAMES EDWARD SANDERS, Seale Hayne Agricultural College, Newton Abbot, Devon.

ANDREW SMITH, West of Scotland Agricultural College.

PHILIP HENRY SMITH, University of Leeds.

LOUISA MARY STANGER, Midland Agricultural and Dairy College, Sutton Bonington.

ALEXANDER BUCHANAN STARK, Armstrong College, Newcastle-on-Tyne.

FRANK WARD STEELE, University College of Wales, Aberystwyth.

LESLIE ROGER SWINDELLS, Harper Adams Agricultural College, Newport, Salop.

SYDNEY PEARCE THOMAS, Seale Hayne Agricultural College, Newton Abbot, Devon.

JOHN TURNER, University of Leeds.

KENNETH ROSS WHYTE, West of Scotland Agricultural College.

ROBERT ANDREW WIGHT, West of Scotland Agricultural College.

WILLIAM WATT WIGHT, Kelham, Newark-on-Trent.

REGINALD THOMAS WIGLESWORTH, Harper Adams Agricultural College, Newport, Salop.

ELLIS EVANS WILLIAMS, University College of North Wales, Bangor.

THOMAS WINTER, Armstrong College, Newcastle-on-Tyne.

DUDLEY CALVERT WITHERS, University of Leeds.

EXAMINATION PAPERS OF PAST YEARS.

Copies of the Papers set at the Annual Examination for the National Diploma in the Science and Practice of Agriculture held in 1929 may be had upon application. Price 6d. per set.

VETERINARY DEPARTMENT

The Society established a Veterinary Department in 1823, but by an arrangement made with the Royal College of Veterinary Surgeons, the Society's examination ceased in 1881. Holders of the Society's Veterinary Certificate are entitled to become Members of the Royal College of Veterinary Surgeons on payment of certain fees, without being required to undergo any further examination. The number of Students who passed for the Society's Certificate is 1183.

The Society votes annually eleven silver medals for Class Competition to each of the two Veterinary Colleges in Scotland, the one in Edinburgh and the other in Glasgow.

FORESTRY DEPARTMENT.

The Society grants **FIRST and SECOND-CLASS CERTIFICATES** in FORESTRY.

1. An Examination will be held each year about the month of March.
2. The next Examination will be held at 8 Eglinton Crescent, Edinburgh, in the month of March 1931, provided a sufficient number of candidates present themselves for examination.

Forms of application may be obtained from the Secretary, Highland and Agricultural Society of Scotland, 8 Eglinton Crescent, Edinburgh, and must be returned duly filled up on or before 18th February 1931.

3. Candidates must possess—1. A thorough acquaintance with the theory and practice of Forestry. 2. A general knowledge of the following branches of study, so far as these apply to Forestry: (a) The Elements of Botany and Forest Zoology; (b) The Elements of Meteorology and Geology; (c) Forest Engineering, including Land and Timber Measuring and Surveying; Mechanics and Construction, as applied to fencing, draining, bridging, road making, and saw-mills; and Implements of Forestry; (d) Book-keeping and Accounts.

4. The Examinations are open to candidates of any age, may be both written and oral, and will include such practical tests as may from time to time be decided to apply.

5. The maximum number of marks for each subject is 100; Pass marks for First-Class Certificate—Forestry, 75; all other subjects, 60. Pass marks for Second-Class Certificate—Forestry, 60; all other subjects, 50.

6. A candidate who obtains Pass marks in certain subjects, but fails in others, may come up for these other subjects alone, it being understood that without the special permission of the Society no candidate will be eligible to enter for more than two subsequent Examinations.

7. A candidate who has obtained the Second-Class Certificate may enter again for the First-Class Certificate.

The list of students who obtained certificates prior to 1899 appears in the 'Transactions,' Fifth Series, vol. xi (1899).

The following have since obtained First-Class Certificates:—

ERIC ARTHUR NOBBS, Department of Agriculture, Cape Town, .	1899
GEORGE POTTS, Grey College, Bloemfontein, Orange River Colony, .	1899
DUNCAN S. RABAGLIATI, 1 St Paul's Road, Bradford, .	1901
FRANK SCOTT, Dumfries House Mains, Cumnock, .	1903
WILLIAM T. STOCKLEY, Rose Villa, Garswood, near Wigan, .	1906
A. FRANK WILSON, C.D.A. (Edin.), Reedieleys, Auchtermuchty, .	1907
GEORGE FISHER, Farm Brook, Pilling, Garstang, Lancs, .	1909

JOHN PATTEN, jun., Hulne Park, Alnwick,	1909
ALEXANDER MITCHELL, Dalmeny Park, Edinburgh,	1909
JOHN D. DAVIDSON, Brimstage, Birkenhead,	1911
DONALD DOULL, M.A., A.R.C.Sc., High School, Kelso,	1911
JAMES W. MACKAY, Jervaulx Abbey, Middleham, Yorks.,	1915
HARRY WATSON, Darnaway, Forres,	1915
REGINALD WATT HUNTER, 94 St George's Terrace, New- castle-on-Tyne,	1919
JOHN M'EWEN, Monaghty Forest, by Elgin	1922
ALFRED POPE, Swinsty Hall, Fewston, Harrogate	1922
WILLIAM LYNE WATT, Department of Agriculture, P.O. Box 323, Nairobi, Kenya Colony, Africa	1926
ROBERT LINDSAY, Royal Botanic Garden, Edinburgh	1930
GEORGE J. THOMSON, Black Lodge, Whitehill, Aberdour, Fife	1930

The following have since obtained Second-Class Certificates :—

WILLIAM BRUCE, B.Sc., East of Scotland College of Agri- culture, Edinburgh,	1901
RAJAPPIER SWAMINATHAN, 56 Jesus Lane, Cambridge,	1901
THOMAS USHER, Courthill, Hawick,	1901
ALLAN CARRUTH, Lawmarnock, Kilbarchan,	1905
ALEX. M. LUMSDEN, Newburn Schoolhouse, Upper Largo,	1905
ROBERT M. WILSON, Laws Cottage, Duns,	1905
THOMAS CAMPBELL, Greystoke, Penrith,	1906
DONALD FERGUSON, Quarry Lane, Lennoxtown,	1906
CHARLES PENRHYN ACKERS, Huntly Manor, Gloucester,	1908
ROBERT HOWIE, Beechwood, Arbroath,	1908
JOHN TROTTER, D.Sc., 22 West Savile Terrace, Edinburgh,	1908
JAMES A. S. WATSON, Downieken, Dundee,	1908
NORMAN H. PEARSON, 52 Percy Park, Tynemouth,	1909
LIONEL F. STOBART, Royal Agricultural College, Ciren- cester,	1911
ALEXANDER GEORGE NORRIE, Cairnhill, by Turriff,	1913
WILLIAM WATT, Darnaway, Forres,	1913
WILLIAM P. GREENFIELD, 6 Littlefield Lane, Grimsby,	1915

SYLLABUS OF EXAMINATION.

I.—SCIENCE OF FORESTRY AND PRACTICAL MANAGE- MENT OF WOODS.

I. *Principles of Scientific Forestry*.—1. The tree: conditions essential for its nutrition and growth. 2. The soil: its physical structure and properties. 3. The different forms of woodland crops. 4. Pure woods and mixed woods. 5. Even-aged and uneven-aged woods. 6. Sylvicultural characteristics of the principal trees, broad-leaved and coniferous, including recently introduced species of sylvicultural value.

II. *Forest Organisation*.—7. General ideas regarding the necessity for a national forest policy. 8. Conditions necessary for the formulation of a regulated system of forest management. 9. Working plans, their compilation, construction, and use.

III. *Practical Management of Forests*.—10. Assessment of the suitability of areas for afforestation purposes. 11. Preparation of areas for planting. 12. Treatment of heather, bracken, scrub. 13. Draining and enclosing. 14. Choice of species for various situations. 15. Seed—harvesting, extraction, storage. 16. Nurseries, temporary and permanent—choice of site, internal lay-out, management, including lifting, packing, and transport of plants. 17. Planting and sowing in the forest—methods suited to various conditions. 18. Natural regeneration by seed. 19. Regeneration by cuttings, layers, stool shoots. 20. Formation of mixed woods, even-aged, uneven-aged, temporary and permanent, use of nurse trees, kinds of nurse trees suitable under different conditions. 21. Tending of young woods. 22. Pruning. 23. Thinning.

IV. *Forest Protection against*—24. Fires, wind, snow, deer, rabbits, squirrels, birds, insects, and fungi.

V. *Timber*.—25. Its technical properties. 26. Its defects. 27. Recognition of different kinds of timber. 28. Processes for increasing its durability.

VI. *Utilisation of Produce*.—29. Uses of wood and other produce. 30. Felling. 31. Conversion. 32. Seasoning. 33. Transport. 34. Measurement, classification, valuation, and marketing of standing timber.

II.—FOREST BOTANY AND FOREST ZOOLOGY.

(a) FOREST BOTANY.

The fundamental facts of morphology, physiology, and classification of plants. The structure and function of the plant-cell and the plant-tissues. Their primary distribution. The secondary changes they exhibit in consequence of perennation.

The structure and function of the root and shoot in flowering-plants. Buds, their forms and uses. The flower. The fruit. The seed.

The structure and function of vegetative and reproductive organs of fungi.

Relationship of plants to air, soil, and water. Effect of light, heat, and mechanical agencies upon plants. Nutrition. The nature and elements of the food of plants. Sources of plant-food. The absorption, elaboration, transference, and storage of food. Respiration and transpiration. Parasites and saprophytes. Symbiosis.

Growth of plants in length and thickness. Correlation of growth, pruning. Germination of seeds. Formation of wood and bark. Healing of wounds.

Diseases of plants due to faulty nutrition and unfavourable circumstances of growth. Diseases due to attacks of fungi.

Natural reproduction and propagation by seeds and by buds. Fertilisation of flowers. Hybridisation. Artificial propagation by budding, grafting, layering, and cutting.

The characters of the large groups and classes of the vegetable kingdom. The characters of the families of plants which include the chief timber trees. The botanical characteristics of the principal British forest-trees (including the structural features of their wood). The weeds of the forest and their significance.

(b) FOREST ZOOLOGY.

General classification of animals. The differences between Vertebrates and Invertebrates.

Earthworms and their relation to soil formation; life-history and habits.

Snails and Slugs: General characters and habits.

Insects: Structure and metamorphosis. General classification; the orders of insects important in forestry. Habits and life-histories of important insects in the following groups: leaf-eaters, bark and stem borers, root feeders, sucking insects, predaceous and parasitic insects.

Insect Control: Natural control; preventive and remedial measures.

Spiders and Mites: General characters and habits.

Birds: Recognition and relation to forestry of crows, jay, woodpecker, hawks, owls and tits, also game birds.

Mammals: General characters of the main groups represented by the deer, rabbit, hedgehog, and weasel; the relation of these to forestry.

III.—METEOROLOGY AND GEOLOGY.

Meteorology.

The atmosphere, its composition and physical properties. Measurement of pressure and temperature. The barometer. Rain, hail, snow, fog, cloud, dew, the dew-point, hoar frost. Gases injurious to vegetation.

Geology.

The crust of the earth, its structure and denudation. Recognition of igneous, sedimentary, and metamorphic rocks. Weathering of rocks and soils; formation of alluvium, gravels, and glacial deposits. The composition, mode of weathering, and distribution of the various geological formations in the British Isles. The relationship of strata to the configuration of a country and to the overlying soils, rainfall, and drainage.

IV.—FOREST ENGINEERING, INCLUDING LAND AND TIMBER MEASURING AND SURVEYING; MECHANICS AND CONSTRUCTION AS APPLIED TO FENCING, BRIDGING, ROAD-MAKING, AND SAW-MILLS.

The use of the level and measuring chain. Chain surveying. Plotting. Levelling and contouring. Measuring and mapping surface areas. Knowledge of the 25" and 6" Ordnance Survey maps and their markings. Use of the planimeter. Plane table surveying. The measurement of solid bodies—as timber, stacked bark, fagots, &c., earthwork.

Use and characteristics of materials—as bricks, stone, lime, mortar, cement, concrete, reinforced concrete, iron, steel.

Simple building construction. Roofs of various types. The construction of simple bridges over streams and gullies. Culverts, &c.

The setting out and formation of roads for temporary and permanent use.

Drainage. Gauging of streams. Water-power. Construction of dams, weirs, water channels, &c. The general arrangement and working of estate saw-mills. Timber slides. Forest tramways. Working and management of steam engines and boilers, oil and petrol engines.

The different modes of fencing and enclosing plantations ; their relative advantages, durability, cost of construction, and repairs.
Detailed drawings from figured sketches.

V.—ARITHMETIC—BOOK-KEEPING.

1. Arithmetic—including Practice, Proportion, and Decimal Fractions.
2. Book-keeping—including the description of books to be kept, the solution of practical questions in Book-keeping and the preparation of Accounts.

EXAMINATION PAPERS, 1930.

SCIENCE OF FORESTRY AND PRACTICAL MANAGEMENT OF WOODS.

(All questions to be attempted.)

1. What precautions are to be observed in choosing a site for a permanent forest nursery ; and what precautions are to be observed in collecting and storing the seed of trees ?

2. In a practically treeless hilly area, the planting of which you are entrusted with, explain the principles which would guide you in arriving at the altitude of profitable tree growth, considering generally the effect of latitude, aspect, and soil (plantable soil being classified good, fair, and poor). State briefly the advantages of such a classification of soils.

3. Explain the method you would adopt in laying down the boundary line of an extensive plantation, assuming that the area to be enclosed is of a hilly and exposed nature.

State the type of fence you would recommend for preventing sheep and ground game from entering the plantation, and give a specification and approximate cost per yard of its erection.

4. At what stage in the life of a coniferous plantation should thinning operations be begun ? State the objects and benefits of thinning.

5. What is the chief object in underplanting certain areas ; and what are the species of trees which are most benefited by it ?

6. How would you proceed to make a valuation of a mixed coniferous plantation the age of which may be from 80 to 100 years. Describe your method of counting and classification and the principles on which you base your figures.

(Three hours allowed.)

FOREST BOTANY AND FOREST ZOOLOGY.

(a) BOTANY.

(THREE questions only to be attempted.)

1. Carefully describe the importance of the green leaf to the tree.
2. Describe Fungi under the heads :—
 - (a) Vegetative structure.
 - (b) Mode of multiplication.
 - (c) Habit of life.
3. Give an account of methods of multiplication of trees and shrubs, other than from seed.
4. Write a life history of the Pine or the Spruce (*Picea*).

(b) ZOOLOGY.

(Two questions only to be attempted.)

1. Compare and contrast an earthworm and a slug in—
 - (a) External characters.
 - (b) Habit of life.
 - (c) Forest importance.
2. Make a list of harmful insect enemies of a nursery of Conifers. Describe in detail any two of them, adding notes on preventive and remedial treatment.
3. State carefully how you would recognise any five of the following: jay, mole, water-rat (or water-vole), crossbill, capercaillie, field-vole, woodpecker. What is the importance in Forestry of each of the five?

(Two hours and a half allowed.)

METEOROLOGY AND GEOLOGY.

(FIVE questions only to be attempted.)

1. From what sources does the atmosphere derive its supplies of carbonic-acid gas (CO_2)? Indicate the part played by this constituent of the atmosphere in the economy of the earth.
2. What is dew, and under what atmospheric conditions is it likely to be formed?
3. By what agencies is the weathering of rocks effected?
4. Give an account of the characters and mode of origin of boulder-clay or till. Contrast the characters of boulder-clay and alluvial clay.
5. What are the chief factors which determine the underground circulation of water? Show, illustrating your answer by diagrams, the more important modes of occurrence of natural springs.
6. Write a short account of the geology of any district with which you are familiar.

(One hour and a half allowed.)

FOREST ENGINEERING.

(All questions to be attempted.)

1. Describe two methods for estimating the quantity of water flowing in a stream. What procedure would you follow in order to utilise this water for power purposes? How would you determine the amount of water-power available?

2. To what depth would 25 loads of earth ($1\frac{1}{2}$ cubic yds. to 1 load) cover a rectangular-shaped plot, 85 ft. wide by 120 long, with a corner 20 ft. by 20 ft. omitted?

3. What is the difference between an ordinary lime and Portland cement? What materials, and their proportions, would you suggest for the construction of a concrete wall with gate-posts? Describe how such a wall should be built. Would it be necessary to strengthen any parts, and if so, how is it usually done?

4. One of the lines of a chain survey crosses a deep ravine, which is impossible to chain across. Give two methods for finding the distance across the ravine without the use of any instrument for angular measurement.

5. You are required to make a survey of an estate extending to about 300 acres. Describe carefully how you would proceed to set about the work.

6. Make up the following Level Book, and check the accuracy of the work. Plot the section to a horizontal scale of $\frac{1}{2}$ in. to 1 chain, and vertical scale of 1 in. to 10 ft.

B. S.	I. S.	F. S.	Risc.	Fall.	R. L.	Distance.	Remarks.
10-30					20-00	Datum	20 ft. below B.M., on gate-post
	7-60					0-00	commencement of section
	6-40					1-00	
	5-10					2-00	
	5-90					3-00	
	8-30					4-00	
	9-11					5-00	
	9-09					6-00	
1-17		10-56				7-00	
	12-13					8-00	
	15-16					9-00	
	14-19					10-00	
	7-18					10-50	
	6-04					11-00	
8-06		7-09				11-50	
11-13		10-11				12-00	End of section B.M. on top of mile-stone
		12-10					

(Two hours allowed.)

ARITHMETIC AND BOOK-KEEPING.

I. ARITHMETIC.

(Only FOUR of the following questions to be attempted.)

Note.—No marks will be awarded to answers unless workings are shown.

1. Find the simple interest on £8450 for 150 days at 5 per cent.
2. A farmer sells eggs at 1s. 10d. per dozen. What should be received for $22\frac{1}{2}$ dozen eggs?
3. A farmer sold 20 cattle for £539, 19s. Thirteen of them were sold for £24, 5s. each. What was the price per head for the remainder?
4. If two labourers can plough a piece of ground in $4\frac{1}{2}$ days, how long should three labourers take to plough the same amount of ground?
5. A field rectangular in shape is 242 yds. long and 80 yds. broad. What is the acreage of the field?
Imperial square measure is as follows:—
 $30\frac{1}{2}$ sq. yds. = 1 sq. pole.
 40 sq. poles = 1 rood.
 4 roods = 1 acre.
6. Divide £700 between A., B., and C. so that A. gets twice as much as B., and B. twice as much as C.

II. BOOK-KEEPING.

(All questions to be attempted.)

1. Give a short narrative of the uses of the following books.—
 (1) Journal.
 (2) Cash-book.
 (3) Ledger.
2. Say which of the following are Capital Expenditure and which are Revenue Expenditure.—
 (1) Purchase of an engine for a saw-mill.
 (2) Payment of foresters' wages.
 (3) Cost of building a forester's house.
 (4) Purchase of a motor-car for the factor.
 (5) Purchase of oil for the saw-mill engine.
3. Make the necessary entries to record the following transactions in the cash-book and ledger accounts, and prepare a statement to prove the accuracy of your entries:—

1930.

Jan.	1.	Cash on sale of cut timber	£20	0	0
"	4.	Sold on credit, firewood to W. Brown	1	0	0
"	4.	Paid for stamps	1	0	0
"	7.	Cash received for sale of young trees	50	0	0
"	8.	Paid cash into bank	50	0	0
"	10.	Paid wages	5	0	0
"	12.	Received from W. Brown in payment of his account	1	0	0
"	14.	Bought on credit from Russell & Son, horse cart	20	0	0
"	17.	Paid for fodder for horse	10	0	0
"	20.	Drawn from bank	25	0	0
"	25.	Paid fire insurance on timber by cheque	3	0	0
"	31.	Paid Russell & Son (cash £19, discount £1)	20	0	0

(Two hours allowed.)

DAIRY DEPARTMENT

EXAMINATION IN THE SCIENCE AND PRACTICE OF DAIRYING

This Examination, instituted in 1897, is conducted by the National Dairy Examination Board, appointed jointly by the Royal Agricultural Society of England, the Highland and Agricultural Society of Scotland, and the British Dairy Farmers' Association.

REGULATIONS.

1. The Societies may hold annually in England and in Scotland, under the management of the National Dairy Examination Board appointed by them, one or more examinations for the National Diploma in the Science and Practice of Dairying; the Diploma to be distinguished shortly by the letters 'N.D.D.'

2. The Examinations will be held on dates and at places from time to time appointed and duly announced.

3. Forms of Entry for the Examination in England may be obtained from 'The Secretary, Royal Agricultural Society of England, 16 Bedford Square, London, W.C.1,' and must be returned to him duly filled up, with the entry fee of £3, 3s., on or before Monday, July 21st, 1930.

4. Forms of Entry for the Examination in Scotland may be obtained from 'The Secretary, Highland and Agricultural Society of Scotland, 8 Eglinton Crescent, Edinburgh,' and must be returned to him duly filled up, with the entry fee of £3, 3s., on or before Saturday, August 2nd, 1930.

5. Any candidate may enter for the Examination either in England or Scotland, but not in both, and a candidate who has once taken part in an Examination in England cannot enter for an Examination in Scotland, or *vice versa*.

6. As a preliminary to the acceptance of an application for permission to enter for the Examination, a candidate must produce :—

- (1) A certificate testifying that he or she has attended a Diploma Course in the subjects of the Examination covering *two academic years* at an approved Dairy Training Institution and has satisfied the authorities of the Institution of his or her fitness for admission to the Examination. This period shall include six session months' instruction (consisting of not more than two periods) in practical dairy work.
- (2) Evidence that he or she has spent at least six months on an approved Dairy farm and taken part in the work. This period must not run concurrently with the six months' practical training referred to in subsection 1.

(An 'approved Dairy Farm' is one on which not fewer than 15 cows are kept in daily milking.)

7. A candidate who has already taken a Degree in Agriculture of a British University or a Diploma in Agriculture recognised by the National Dairy Examination Board, will be allowed to enter for the National Diploma in Dairying Examination after one year's subsequent training at an approved Dairy Training Institution, providing that such course includes at least six months' training in practical dairy work, and that he or she has worked for at least six months on an approved Dairy Farm.

8. In the Examination a candidate will be required to satisfy the Examiners by means of written papers, practical work, and *viva voce*, that he or she has :—

- (1) A general knowledge of the Management of a Dairy Farm, including the rearing and feeding of Dairy Stock, the candidate being required to satisfy the Examiners that he or she has had a thorough training and practical experience in all the details of Dairy work as pursued on a farm.
- (2) A thorough acquaintance, both practical and scientific, with everything connected with the management of a Dairy, and the manufacture of Butter and Cheese.
- (3) A general knowledge of Dairy Factory Management, Dairy Hygiene, Dairy Engineering, and Dairy Book-keeping.
- (4) Practical skill in Dairying, to be tested by the making of Butter and Cheese.

NOTE.—A candidate must be prepared to make any one of the following varieties of Hard Pressed Cheese, the Examiner in Cheesemaking having the option of saying during the Examination what variety a candidate shall make :—

AT THE ENGLISH CENTRE : Cheddar, Cheshire, or Derby.

AT THE SCOTTISH CENTRE : Cheddar, Dunlop, or Cheshire.

9. The maximum marks obtainable, and the marks required for a pass in each subject are as follows:—

WRITTEN EXAMINATION—	Max.	Pass.
Dairy Farming	150	90
Dairy Hygiene	100	60
Dairying—		
(a) Principles of Dairying	150	90
(b) Dairy Factory Management and Dairy Engineering	100	50
Chemistry	100	60
(a) General Chemistry and Physics.		
(b) Dairy Chemistry.		
Dairy Bacteriology	100	60
Dairy Book-keeping	100	50
PRACTICAL EXAMINATION—		
Hard-pressed Cheese-making	200	150
Blue-veined Cheese-making	100	75
Soft Cheese-making	100	75
Butter-making	200	150
	1400	910

Honours will be awarded to candidates obtaining an aggregate of 80 per cent (1120) of the maximum marks (1400) in the Examination, provided that they also obtain at least 80 per cent (400) of the maximum marks (500) in the Dairy Farming, Hygiene, and Dairying papers.

10. (1) A candidate who fails in any part of the practical examination shall fail in the whole examination.
- (2) A candidate who fails in three or more subjects of the written examination shall fail in the whole examination.
- (3) A candidate who, having passed in the practical examination, fails in not more than two subjects of the written examination may, at the discretion of the Board, appear for those subjects in the following year.

11. A non-returnable fee of *Three Guineas* will be required from each new candidate. The fee for reappearance in the whole Examination will be *Three Guineas*, and for reappearance in not more than two written papers *One Guinea*.

12. The Board reserve the right to postpone, to abandon, or in any way or at any time to modify an Examination, and also to decline at any stage to admit any particular candidate to the Examination.

DATES OF EXAMINATIONS.

ENGLAND.—THURSDAY, September 4th, and following days, at the University and British Dairy Institute, Reading. Last date for receiving applications, MONDAY, July 21st.

SCOTLAND.—At Dairy School, Kilmarnock. WRITTEN—THURSDAY, FRIDAY, and SATURDAY, September 4th, 5th, and 6th. ORAL AND PRACTICAL—MONDAY, September 15th, and following days. Last date for receiving applications, SATURDAY, August 2nd.

SYLLABUS OF SUBJECTS OF EXAMINATION

1.—DAIRY FARMING AND DAIRY HYGIENE.

(a) DAIRY FARMING.

SOILS AND CROPS.—Types of Soils suitable for dairying. Rotations and systems of cropping. Cultivation, manuring and management of grain, root and forage crops used in dairying. Silage. Temporary and permanent pastures, haymaking.

PLANT PHYSIOLOGY.—Roots, shoots, flowers, fruit and seeds of agricultural plants.

DAIRY CATTLE.—Characteristics of different breeds. Relation of conformation and appearance to Milk Yield. Choice of dairy cattle in relation to climate and soil. The milk yields of the more important breeds, and suitability for the milk trade, cream, butter and cheese production.

The management of a Dairy Herd. Cattle breeding and grading up of dairy stock. Calf rearing and management of young stock.

Milk Recording. Systems, and utilisation of results. Details of official schemes.

FOODS AND FEEDING.—Summer and winter feeding of dairy cattle and young stock. Fodder crops and green forage. Roots. Ensilage. Concentrated foods, meals, cakes. Preparation of food. The effect of food on milk and its products.

PIG KEEPING.—Characteristics of the more important breeds. The breeding, rearing and fattening of pigs. Production of pork and bacon.

FARM MANAGEMENT.—Systems of dairy farming. The selection, stocking and equipment of typical farms. Organisation of the farm and disposal of produce.

DAIRY ECONOMICS.—The Dairy Industry of Great Britain and its relationship to Agriculture. The relative importance of the various products. The retail milk trade. Markets, Dairy organisation and co-operation. Modern developments in the Dairy industry. Sources of imported Dairy Produce.

(b) DAIRY HYGIENE.

ANIMAL PHYSIOLOGY.—General functions of the organs of the animal body. Breeding. Parturition. The structure of the udder and the process of milk secretion. Changes which food undergoes during digestion.

VETERINARY.—The more important diseases of dairy cattle and their treatment. The transmission and eradication of disease.

MILK HYGIENE.—Sanitary conditions. Suitability of water supply. Methods of milking and handling of milk. Regulations affecting milk production. Milk in relation to Public Health.

FARM BUILDINGS.—Situation, chief dimensions and construction of cow houses and dairy buildings. Housing for young stock and pigs. Air space and ventilation, drainage and water supply.

II.—DAIRYING.

(a) PRINCIPLES OF DAIRYING.

MILK.—Milking by hand and machinery. Importance of cleanliness. Cooling of milk. Prevention of contamination. Pasteurisation. Sterilisation. Keeping of milk. Milk testing and sampling. Use of Gerber and Babcock Testers. Interpretation of results. Legal standards. Legislation affecting milk production.

CREAM.—Separators and their management. Different systems of cream raising and ripening of cream. Changes during ripening. Natural and artificial ripening, and preparation and uses of starters. Preparation of cream for sale. Uses of preservatives. Clotted cream.

BUTTER.—Churns and butter-making appliances. Preparation of cream for churning. Washing and working butter. Butter milk. Packing and transmission of butter. Selection and keeping of butter. Salting. Use of preservatives. Characteristics of good butter and method of judging. Circumstances affecting the flavour, texture, colour and keeping qualities of butter. Potting butter for keeping. Causes of inferior butter.

CHEESE.—Principles of manufacture. Appliances for cheese-making. The making of the principal varieties of British, Colonial and Continental cheese from cream, whole milk and skim milk. Acidity of milk. Common tests for acidity. Uses of rennet and its substitutes. Whey. Ripening and storage of cheese. Packing and sale of cheese. Making of cream and other soft cheese. Defects in cheese and their causes. Judging cheese.

(b) DAIRY FACTORY MANAGEMENT AND DAIRY ENGINEERING.

FACTORY PRACTICE.—Milk depots and handling of factory milk. Systems of cooling and refrigeration. Pasteurisation. Factory butter and cheese-making. Milk Powders. Condensed milk. Frozen milk. Ice cream. Dried casein. Fermented milk. Lactose and

whewy-butter. Margarine manufacture. Equipment of milk depots, butter, cheese and dairy factories.

FACTORY MANAGEMENT.—Factory routine. Organisation of labour. Handling of milk on arrival at the factory. Methods of dealing with the milk. Milk contracts. Dairy factory legislation.

DAIRY APPLIANCES AND MACHINERY.—Appliances used in the production and handling of milk, butter and cheese. Care and management of engines and boilers, dairy factory machinery, refrigerating machinery.

BUILDINGS.—Situation, construction and drainage of creameries, milk depots and dairy factories.

III.—CHEMISTRY.

(a) GENERAL CHEMISTRY AND PHYSICS.

CHEMISTRY.—Elements, compounds and mixtures. Chemical symbols, formulæ and equations. Acids, bases, salts: their distinctive properties. Acidity and alkalinity; their quantitative estimation. The Atmosphere: its constituents and impurities; influence on dairying operations. Water: its constitution; pure and natural waters; impurities in water and whence derived. Importance of a good water supply in dairying. General knowledge of elementary chemistry. Oxygen; hydrogen; carbon; nitrogen; phosphorus and sulphur; common metals; common acids; compounds of potassium, sodium, ammonium, calcium.

Elementary organic chemistry; sugar, milk sugar, starch, alcohol, acetic acid, formaldehyde, butyric acid, lactic acid, glycerine, saponification of fats; albumen, casein, pepsin.

PHYSICS.—The different forms of matter; solid, liquid, gaseous. Specific gravity and instruments for determining it. Temperature and methods of measuring it. Expansion; thermometric scales. Influence of temperature in dairy operations. Atmospheric pressure and its measurement. Hygrometry. Heat and its measurement; specific heat. Latent heat. Conduction. Convection. Radiation. Solution. Filtration. Distillation. Simple machines, such as levers, pulleys and light weighing machines.

(b) DAIRY CHEMISTRY.

CHEMISTRY OF MILK.—The nature, composition, properties and chemical constituents of milk. Microscopical appearances presented by milk. The influence of feeding. The changes which occur in the keeping of milk, and how produced. The natural and artificial souring of milk. Rennet, its nature and uses.

MILK PRODUCTS.—Physical and chemical changes involved in the making and keeping of butter and in the manufacture and ripening of cheese. Separated milk. Condensed milk. Fermented milk. Synthetic milk. The use of preservatives.

DAIRY ANALYSIS.—Analytical methods, their theory and practice. A general knowledge of the methods employed in the chemical analysis of milk, butter, and cheese. Adulteration of milk, cream, butter, and cheese, the ways in which adulteration is practised, the changes in composition thereby produced, and a general knowledge of the methods employed in detecting the same.

CHEMISTRY OF FEEDING.—The principal constituents of food materials and the functions they severally fulfil. The influence of food constituents on milk production. Assimilation and digestion. The manurial value of foods. Milk and milk products as foods.

N.B.—Candidates are required to bring their Laboratory Notes to the Oral Examination in this subject.

IV.—DAIRY BACTERIOLOGY.

GENERAL BACTERIOLOGY.—Bacteria; their form, classification, growth, and reproduction. The microscope and its use. Staining and microscopic examination of bacteria. Methods of isolation and cultivation. Preparation of culture media. Fermentations and chemical changes produced by bacteria. Enzymes and their action. Effects of heat, cold, sterilisation, pasteurisation, disinfectants, and preservatives on bacteria and enzymes. Bacteriological examination of water supplies.

BACTERIOLOGY OF MILK.—The changes produced by bacteria in milk. Useful forms and their functions. Harmful forms and their effects. Coagulation, discoloration, taints, &c. Bacteriological and other standards in relation to the cleanliness of milk.

MILK PRODUCTS.—The bacteria concerned in the ripening of cream and butter-making. 'Starters,' their preparation and management. The ripening of hard, soft, and blue-veined cheese. Bacteria injurious to milk products, including condensed and dried milk.

DAIRY MYCOLOGY.—Moulds and yeasts in dairy practice. Their form, classification, growth, and relation to dairy products.

N.B.—Candidates are required to bring their Laboratory Notes to the Oral Examination in this subject.

V.—DAIRY BOOK-KEEPING.

GENERAL PRINCIPLES.—Principles of double-entry book-keeping. Use of diary, journal, cash-book, and ledger. Posting to ledger. Preparation of profit and loss account and balance-sheet. Systems of valuation.

FARM BOOK-KEEPING.—Application of the principles of book-keeping to dairy farming and to the sale of milk in bulk or by retail.

FACTORY ACCOUNTS.—Methods of book-keeping as applied to milk depots and dairy factories.

BUSINESS MANAGEMENT.—General office work. Banking and use of cheques.

VI.—PRACTICAL SKILL IN DAIRY WORK.

Candidates must be prepared—(1) to produce before the Examination a satisfactory certificate of proficiency in the milking of cows, signed by a practical Dairy Farmer, and to satisfy the Examiners by a practical test, if so required; (2) to churn and make into Butter a measured quantity of Cream; and (3) to make one Cheese of each of the following varieties: (1) Hard-pressed, of not less than 30 lb. (see Note to Reg. 8 (4)); (2) Veined or blue-moulded, of not less than 10 lb.; and (3) also to make one or other of the following Soft Cheeses: Cambridge, Camembert, Coulommier, or Pont l'Eveque.

The following obtained the Diploma in Scotland in 1929:—

Diploma.

MARGARET DIANA BALDWIN, 50 Birstwith Road, Harrogate.
 ELIZABETH MAISTE CHISHOLM, Mayfield, Ladysbridge, Banff.
 CYRIL DANIEL, Trewoon, St Austell, Cornwall.
 BATHIA MARY DAVIDSON, Ladysford, Fraserburgh.
 ELIZABETH SWANSON DAVIDSON, Buckies, Thurso.
 SHASHI KANTA K. DESAI, Palace Dairy Farm, Baroda, India.
 MARGARET DOULL, Old Bank House, Lybster, Caithness.
 JOSEPH EDWARDS, Belvideer, Motherwell.
 JANEY EWING GENTLE, 27 Trefoil Avenue, Glasgow, S.1.
 JOHNSTON BOYD HENDERSON, Great Shoemiths Farm, Wadhurst, Sussex.
 LILY TURNER HEPBURN, The Kennels, Glenrinnies, by Dufftown.
 NORMAN LEIGH, Harrismith, Orange Free State, South Africa.
 THOMAS HETHERINGTON LUNSON, 24 Musgrave Street, Penrith, Cumberland.
 ANNIE M'ARTHUR, Bay M'Neill, Achosnich, Acharacle, Argyll.
 MARGARET MACBEAN, Killiehuntly, Kingussie.
 JOHN FREDERICK OXENHAM, 14 Coinagehall Street, Helston, Cornwall.
 PUSHPANATHA RAJAREHEAM PILLAI, Nedungadu Port, Tanjore Dt., S. India.
 MOLLIE NEWLANDS PRINGLE, 1 Griffiths Street, Falkirk.

WILLIAM T. ROWE, Harper Adams Agricultural College, Newport, Salop.

ANAND LAL SAH, Naini Tal, U.P., India.

SODHI GAMBHIR SINGH, Village Ramgarh Daun, District Ambala, Punjab, India.

MARGARET ELIZABETH STEPHEN, Conglass, Inverurie.

ILANORA MARGHADALE UNKLES, Portaskaig, Isle of Islay.

The following gained the Diploma in England in 1929 :—

Diploma.

LILY CECILIA BALL, Lancashire County Council Dairy School, Hutton, Preston.

VIOLET FRANCES BOSANQUET, Studley College, Warwickshire.

VIOLET PEARSON BRUFF, Midland Agricultural and Dairy College, Sutton Bonington.

GEORGE WARWICK CHANNON, The University and British Dairy Institute, Reading.

FRANCES CHAPMAN, Lancashire County Council Dairy School, Hutton, Preston.

DUNCAN CYRIL CLARKE, Midland Agricultural and Dairy College, Sutton Bonington.

BERTHA BRONWEN EVANS, University College of Wales, Aberystwyth.

CECIL JOHN EVERETT, East Anglian Institute of Agriculture, Chelmsford.

OLIVE SYLVIA FENTON, Midland Agricultural and Dairy College, Sutton Bonington.

JOSIAH GUNSTON, East Anglian Institute of Agriculture, Chelmsford.

BARBARA LEEDS HARRISON, The University and British Dairy Institute, Reading.

GWENETH CICELY HEARN, The University and British Dairy Institute, Reading.

AUDREY MAUD HIEHLE, East Anglian Institute of Agriculture, Chelmsford.

EDWARD RICHARD HODGES, The University and British Dairy Institute, Reading.

HETTY GWENDOLEN JONES, University College of Wales, Aberystwyth.

MARIAN ELUNED JONES, University College of Wales, Aberystwyth.

EMMELINE LACON, Midland Agricultural and Dairy College, Sutton Bonington.

CHARLES ERNEST LESSER, The University and British Dairy Institute, Reading.

PHYLLIS ETHEL WHEELER LYNDRIDGE, East Anglian Institute of Agriculture, Chelmsford.

MARGARET MITCHELL, The University and British Dairy Institute, Reading.

THEODORA MORRIS, Studley College, Warwickshire.

MARY SYBIL ORTON, Midland Agricultural and Dairy College, Sutton Bonington.

ITA IRENE OWEN, University College of Wales, Aberystwyth.

JENNIE PHILIPSON, Lancashire County Council Dairy School,
Hutton, Preston.

WINIFRED JOAN SANDERSON, The University and British Dairy
Institute, Reading.

ANNIE ALICE SHEARMAN, Midland Agricultural and Dairy College,
Sutton Bonington.

LOUISA MARY STANGER, Midland Agricultural and Dairy College,
Sutton Bonington.

CHARLES FOX STENSON, Midland Agricultural and Dairy College,
Sutton Bonington.

NANCY TAYLOR, Lancashire County Council Dairy School, Hutton,
Preston.

ELIZABETH MARY WHEELER, The University and British Dairy
Institute, Reading.

EXAMINATION PAPERS OF PAST YEARS.

Copies of papers set at past Examinations in Dairying, so far as
available, may be had on application. Price 6d. per set.

CHEMICAL DEPARTMENT

Chemist to the Society—J. F. TOCHER, D.Sc., F.I.C., Crown Mansions,
41½ Union Street, Aberdeen.

The object of the Chemical Department is to promote the diffusion of a knowledge of Chemistry as applied to agriculture among the members of the Society, to carry out experiments for that purpose, to assist members who are engaged in making local experiments requiring the direction or services of a chemist, to direct members in regard to the use of manures and feeding-stuffs, to assist them to put the purchase of these substances under proper control, and in general to consider all matters coming under the Society's notice in connection with the Chemistry of Agriculture.

MEMBERS' PRIVILEGES IN RESPECT TO ANALYSES.

MANURES, FEEDING-STUFFS, SOILS, AND
AGRICULTURAL PRODUCTS.

This scale of fees applies only to members whose subscriptions are not in arrears.

The fees for analyses made for members of the Society shall, until further notice, be as follows:—

The determination of one ingredient in a single sample of a <i>manure</i> or of a <i>feeding-stuff</i> ,	5s.
The determination of two or more ingredients in a single sample of a <i>manure</i> or of a <i>feeding-stuff</i> ,	10s.

For example—

Linseed and other cakes, for oil or for albuminoids,	} 5s.
Feeding-meals, ground cereals, for oil or for albuminoids,	
Bone-meals, for nitrogen or for phosphate,	
Compound manures, for nitrogen or for soluble phosphates, or for insoluble phosphates or for potash,	
Superphosphate, for soluble phosphate or for insoluble phosphate,	
Thomas-phosphate powder, for citric soluble phosphate or for total phosphate,	} 10s.
Linseed and other cakes, for oil and albuminoids, &c.,	
Feeding-meals, ground cereals, for oil, albuminoids, &c.,	
Bone-meals, for nitrogen, phosphate, &c.,	
Compound manures, for nitrogen, soluble phosphates, insoluble phosphates, and potash,	
Superphosphate, for soluble phosphate and insoluble phosphate,	
Thomas-phosphate powder, for citric soluble phosphate and total phosphate,	

Limestone, giving the percentage of lime,	£0 5 0
Limestone, complete analysis,	1 0 0
Lime, including ground lime, percentage of alkaline lime,	0 5 0
" " " complete analysis,	1 0 0
Analysis of soil, to determine fertility and recommendation of manurial treatment,	1 10 0
Complete analysis of soil,	2 10 0
Analysis of agricultural products—hay, grain, ensilage, roots, &c.,	1 0 0

Not more than four samples per annum will be analysed under the Society's scheme for any one member.

Note to Members sending Samples for Analysis.

The Directors are anxious to take any steps in their power to expose the vendors of inferior fertilisers and feeding-stuffs, and the members can give them assistance in this by supplying to the chemist, when sending samples for analyses, information as to the guarantee, if any, on which the goods were sold, and also as to the price charged.

These charges apply only to analyses made for agricultural purposes, and for the sole and private use of members of the Highland and Agricultural Society who are not engaged in the manufacture or sale of the substances analysed.

Valuations of manures, according to the Society's scale of units, will be supplied if requested.

DAIRY PRODUCE.

Milk, full analysis,	£0 10 0
" solids and fat,	0 5 0
" fat only,	0 2 6

(Not more than six samples of milk per annum will be analysed under the Society's scheme for any one member.)

Butter, full analysis,	0 10 0
" partial analysis (water and fat),	0 5 0
Cheese,	0 10 0

WATER.

Analysis of water ¹ to determine purity and fitness for domestic use (the Committee reserve power to refuse from one member more than two samples annually under the Society's scheme).....at the reduced fee of	1 0 0
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MISCELLANEOUS.

Search for poisons in food or viscera,	2 0 0
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(Veterinary surgeons are not entitled to have searches made for poisons in food or viscera under the Society's scheme for clients who are not members of the Society.)

Sulphate of copper, percentage of copper and purity,	0 5 0
" " complete analysis,	0 10 0

Arsenic, carbolic acid and tar acids, and other poisons used in making sheep dips, insecticides, &c.,	5s. to £1
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Samples should be sent (carriage paid) to Dr J. F. Tocher, Crown Mansions, 41½ Union Street, Aberdeen.

¹ Cases containing bottles for water samples and instructions for sampling are sent from the laboratory on application.

INSTRUCTIONS FOR SELECTING SAMPLES FOR ANALYSIS.

MANURES.

Any method of sampling mutually agreed upon between buyer and seller may be adopted, but the following method is recommended as a very complete and satisfactory one: Four or more bags should be selected for sampling. Each bag is to be emptied out separately on a clean floor, worked through with the spade, and one spadeful taken out and set aside. The four or more spadefuls thus set aside are to be mixed together until a uniform mixture is obtained. Of this mixture one spadeful is to be taken, spread on paper, and still more thoroughly mixed, any lumps which it may contain being broken down with the hand. Of this mixture two samples of about half a pound each should be taken by the purchaser or his agent, in the presence of the seller or his agent or two witnesses (due notice having been given to the seller of the time and place of sampling), and these samples should be taken as quickly as possible, and put into bottles or tin cases to prevent loss of moisture, and having been labelled, should be sealed by the samplers—one or more samples to be retained by the purchaser, and one to be sent to the chemist for analysis.

FEEDING-STUFFS.

Samples of feeding-stuffs which are in the form of meal may be taken in a similar manner.

Samples of cake should be taken by selecting four or more cakes from the bulk. These should be nipped to a size not larger than walnuts. The nipped cake should then be thoroughly mixed and samples of not less than one pound each taken from it. The samples should be put into bottles or tins, sealed up, and labelled. One sample should be sent to the analyst, and one or more duplicates retained by the purchaser.

SOILS.

Dig a little trench about two feet deep, exposing the soil and subsoil. Cut from the side of this trench vertical scrapings of the soil down to the top of the subsoil. Catch these on a clean board, and collect in this manner two pounds of soil taken from the whole surface of the section. Similar scrapings of subsoil immediately below should be taken and preserved separately. Five or six similarly drawn samples at least should be taken from different parts of the field, and kept separate while being sent to the chemist, that he may examine them individually before mixing in the laboratory.

VEGETABLE PRODUCTS.

Turnips, &c., at least 50 bulbs carefully selected as of fair average growth.

Hay, straw, ensilage, &c., should be sampled from a thin section cut across the whole stack or silo, and carefully mixed; above 2 lb. weight is required for analysis.

Grain should be sampled like manures.

DAIRY PRODUCE.

Milk.—Samples of milk from individual cows should be taken direct from the milk-pail after complete milking. Average samples from a num-

ber of cows should be taken immediately after milking. Specify whether the sample is morning or evening milk, or a mixture of these. Samples to be tested for adulteration should not be drawn from the bottom or taken from the top of standing milk, but they should be ladled from the vessel after the milk has been thoroughly mixed. Samples of milk should be sent immediately to the analyst.

For most purposes a half-pint bottle of milk is a large enough sample.

Butter and Cheese.—About quarter-pound samples are required.

WATERS.

When the water is from a well, it should be pumped for some minutes before taking the sample.

If the well has been standing unused for a long time, it should be pumped for some hours, so that the water may be renewed as far as possible.

If the well has been newly dug or cleaned out, it should be pumped as dry as possible, daily, for a week before taking the sample.

Water from cisterns, tanks, ponds, &c., should be sampled by immersing the bottle entirely under the water, and holding it, neck upwards, some inches below the surface. *Water from the surface should not be allowed to enter the bottle.*

Spring or stream water should not be sampled in very wet weather, but when the water is in ordinary condition. Such waters should be sampled by immersing the bottle, if possible; but if not deep enough for that purpose, a perfectly clean cup should be used for transferring the water to the bottle.

When the bottle has been filled the stopper should be rinsed in the water before replacing it.

Interference with or disturbance of wells or springs, or the ground in their immediate vicinity, must be carefully avoided during sampling, and for at least twenty-four hours before it.

After a sample has been taken, it should be sent to the laboratory as speedily as possible.

A description of the source and circumstances of the water should accompany the sample, as the interpretation of the analytical results depends to some extent on a knowledge of such particulars.

N.B.—Stone jars and old wine bottles are unsuitable for conveying samples. Winchester quarts chemically cleaned should be obtained from the laboratory, Crown Mansions, 41½ Union Street, Aberdeen.

LOCAL ANALYTICAL ASSOCIATIONS.

With the view of encouraging, as well as regulating the conduct of, Local Analytical Associations, the Society, from 1881 to 1893, contributed from its funds towards their expenses a sum not exceeding £250 annually. In view of the passing of the Fertilisers and Feeding Stuffs Act, 1893, it was decided, at a meeting of the Directors on the 6th of December 1893, to discontinue that grant after the 1st of March 1894.

COMPOSITION AND CHARACTERISTICS OF MANURES
AND FEEDING-STUFFS.

(See 'Transactions,' Fifth Series, vol. xi., 1899.)

FORMS OF GUARANTEE

GUARANTEE OF MANURE.

I guarantee that the manure called.....and sold by me to
.....contains—

Soluble phosphoric acid = Phosphate of lime dissolved.per cent
Insoluble phosphoric acid = Phosphate of lime undissolved.....per cent.
Potash salts . . . = Potash (K_2O)per cent.
Total nitrogenper cent.

Signature of seller.....

Date 19 .

GUARANTEE OF FEEDING-STUFF.

I guarantee that the feeding-stuff called.....and sold by me to
.....contains—

..... per cent albuminoids.
 per cent oil.

Signature of seller....

Date 19...

[PRICES OF FERTILISERS. &C.]

PRICES OF FERTILISERS AND FEEDING-STUFFS FOR SEASON 1930.

(Cash Prices as fixed on 5th February. These prices are subject to variation from month to month or oftener.)

SUPERPHOSPHATES.

ITEM TO BE VALUED.	PRICES PER UNIT FOR THE UNDERNOTED PERCENTAGES.		
	13.75 80	16.00 85	17.5 88
PHOSPHORIC ACID DISSOLVED . . . = TRICALCIUM PHOSPHATE DISSOLVED			
February Price . . . { Leith Glasgow	£2 17 6 2 15 0	£3 2 6 3 1 3	£3 7 6 3 6 8
Price per Unit . . . { Leith Glasgow	4/2½ 4/-	3/11 3/10	3/10½ 3/9½

FERTILISERS.

(Other than Superphosphates.)

Name of Fertiliser.	Guarantee.	Price per Ton.	Price per Unit.
Sulphate of Ammonia (neutral)* . . .	20.6 % Nitrogen	£ s. d. 10 2 0	" d. 0 0½
Basic Slag ††	13 % Total Phos. Acid = 28.36 % Tric. Phos.	2 7 6	3 7½
" " †	14 % Total Phos. Acid = 30.57 % Tric. Phos.	2 10 0	3 1½
" " †	18 % Total Phos. Acid = 39.80 % Tric. Phos.	3 5 0	3 7½
Potassic Slag	10 % Phos. Acid = 21.84 % Tric. Phos.		P 4 10½ Pot. 4 8½
Bone Meal (Home and Indian) . . .	4 % Potash 4 % Nit., 20 % Phos. Acid = 43.68 % Tric. Phos.	3 7 6 8 15 0	N 19 5½ P 4 10½
Steamed Bone Flour	0.75 % Nit., 27.5 % Phos. Acid = 60.06 % Tric. Phos.	5 10 0	N 14 5 P 3 7½
Calcium Cyanamide (Nitrolim) ‖ . . .	20.6 % Nitrogen	9 4 0	N 8 11½
Ground Mineral Phosphate § . . .	26 % Phos. Acid = 56.79 % Tric. Phos.	2 6 6	1 9½
" " " §	34 % Phos. Acid = 74.26 % Tric. Phos.	8 9 0	2 0½
Potassic Mineral Phosphate . . .	5 % Pot., 18 % Phos. Acid = 39.80 % Tric. Phos.	3 7 6	P 2 5½ Pot. 4 6½
" " "	10 % Pot., 18 % Phos. Acid = 39.80 % Tric. Phos.	3 15 0	P 2 0 Pot. 3 10½
Nitrate of Soda*	15.5 % Nitrogen	10 2 0	13 0½
Nitro Chalk*	15.5 % "	9 19 0	12 1½
Kainit	14 % Potash	3 2 6	4 5½
Potash Salts	30 % "	5 0 0	3 4
" " "	20 % "	3 12 6	3 7½
Sulphate of Potash	48.5 % "	11 5 0	4 7½
Muriate of Potash	50 % "	9 2 6	3 7½

The prices for all fertilisers are cash prices for two-ton lots in bags at Leith or Glasgow unless otherwise stated.

* Carriage paid to any railway station in six-ton lots. Four-ton lots 1/- more.

† Prices at Leith and Glasgow (5/-, less Ex. ship).

‡ The fineness of Basic Slag is such that 80 % of the powder will pass through the standard sieve. ‖ Four-ton lots carriage paid.

§ 75 % passing through standard sieve (2/6 more for 85 % of powder passing through standard sieve).

N.B.—When these units are multiplied by the percentages in the analysis of a Manure, they will produce a value representing very nearly the cash price per ton at which TWO TONS may be bought in fine sowing condition at Leith or Glasgow. Larger purchases may be made on more favourable terms.

FEEDING-STUFFS.

Name of Feeding Stuff.	Price per Ton.	Name of Feeding Stuff.	Price per Ton.
	£ s. d.		£ s. d.
Linseed Cake (Home) at Leith	11 15 0	Medium Bran	5 15 0
" " at Glasgow	12 0 0	Thirds or Parings	6 17 6
Cotton Seed Cake (Bombay)	6 0 0	Dried Distillery Grains	7 12 6
Cotton Seed Cake (Egyptian) at Leith	6 10 0	" " Brewers' Grains	5 0 0
Ground Nut Cake—Leith—		Feeding Treacle	7 2 6
Decorticated, 7% Oil, 47% Albuminoids	10 12 6	Locust Beans (Kibbled)*	7 15 0
Undecorticated, 8% Oil, 81% Albuminoids	7 5 0	Maize (Round Plate)*	7 5 0
Palm Kernel Cake	9 15 0	" (Flaked)*	9 5 0
Decorticated Cotton Seed Meal—		Beans (Imported China) (Glasgow)	9 10 0
5% Oil, 36% Albuminoids	10 10 0	Bean Meal	10 10 0
7% Oil, 42% Albuminoids	11 2 6	Soya Bean Meal	10 0 0
Rice Bran Meal	5 15 0	" " Cake	10 5 0
Broad Bran	6 10 0	Home Oats (Feeding)	5 5 0
		White Fish Meal (Aberdeen)	18 0 0
		" " (Leith)	18 15 0
		" " (Glasgow)	19 5 0

* In Railway Sacks

CLASSIFICATION OF MANURES.

BONE MEALS	{	Genuine Bone Meal contains about 20 per cent Phosphoric Acid equal to 48.7 per cent Tricalcium Phosphate, and from 2.75 per cent to 4 per cent Nitrogen. If phosphates are low, nitrogen will be high, and conversely.
STEAMED BONE FLOUR	{	Ground to flour, and containing 27.5 per cent Phosphoric Acid equal to about 60 per cent Phosphates and about .8 per cent Nitrogen.
MIXTURES AND COMPOUND MANURES	{	To be valued according to the following units: Nitrogen, 10/-; Soluble Phosphoric Acid, 4/8; Insoluble Phosphoric Acid, 2/9; and Potash, 4/-. The value given is exclusive of mixing, bags, and bagging, and is the value at Leith or Glasgow.
DISSOLVED BONES	{	Must be pure—i.e., containing nothing but natural bones and sulphuric acid.

INSTRUCTIONS FOR VALUING MANURES.

The unit used for the valuation of manures is the hundredth part of a ton, and as the results of analyses of manures are expressed in parts per hundred, the percentage of any ingredient of a manure when multiplied by the price of the unit of that ingredient represents the value of the quantity of it contained in a ton.

As an example take muriate of potash; a good sample (see p. 46) will be guaranteed to contain 50 per cent of oxide of potash. All potash manures are valued according to the amount of potash (oxide of potash) they yield, and muriate of potash yields 50 per cent of potash (K_2O)—i.e., 50 units per ton; and as a ton of muriate of potash costs £9, 2s. 6d., the price of the unit is the fiftieth part of that—viz., $3/7\frac{1}{2}$. If on analysis a sample of muriate of potash guaranteed to contain 50 per cent of potash is found to contain only 48 per cent, the price per ton will be $7/3\frac{1}{2}$ (twice $3/7\frac{1}{2}$) less—viz., £8, 15s. $2\frac{1}{2}$ d.

Similarly with all other manures, the price per unit is derived from the price per ton of a sample of good material up to its guarantee, and therefore the proper price per ton of a manure is found by multiplying the price of the unit of the valuable ingredient by the percentage as found by analysis. If a manure contains more than one valuable ingredient, the unit value of each ingredient is multiplied by its percentage, and the values so found when added together give approximately the price per ton of the manure.

Nitrate of soda contains no ammonia, but it contains nitrogen, and 14 units of nitrogen are equivalent to 17 units of ammonia.

The commercial values of manures are determined by means of the UNITS in the following manner:—

Take the results of analysis of the manure, and look for the following substances:—

Phosphates dissolved (or soluble phosphoric acid)	} No other items but these are to be valued.
Phosphates undissolved (or insoluble phosphoric acid)	
Total phosphoric acid	
Nitrogen	
Potash	

Should the results of analysis or the guarantee not be expressed in that way, the chemist or the seller should be asked to state the quantities in these terms.

Suppose the manure is ground mineral phosphate—

The proportion of phosphate present in a sample guaranteed to contain 34 per cent phosphoric acid, may be 32 per cent phosphoric acid. The price per unit of phosphoric acid in ground mineral phosphate (34 per cent grade) is 2s. 0½d. The value of ground mineral phosphate containing 32 per cent phosphoric acid is therefore 32 times 2s. 0½d., equal to £3, 4s. 8d. per ton.

Suppose the manure is a superphosphate—say an ordinary superphosphate, 15 per cent soluble phosphoric acid,—the price per unit of phosphoric acid in superphosphate (16 per cent grade) is 3/11 at Leith.

It is valued thus—

Soluble phosphoric acid. 15 times 3/11, equal to £2, 18s. 9d.

Insoluble phosphoric acid is not valued in a superphosphate.

Suppose the manure is a compound fertiliser containing 4 per cent nitrogen; 7 per cent soluble phosphoric acid; 3 per cent insoluble phosphoric acid; and 4 per cent potash.

The value of the—

Nitrogen	will be 4 times 10/- = £2 0 0 per ton.
Soluble phosphoric acid	„ 7 „ 4/3 = 1 9 9 „
Insoluble „	„ 3 „ 2/9 = 0 8 3 „
Potash	„ 4 „ 4/- = 0 16 0 „
	<hr/> £4 14 0

The value of this manure will thus be £4, 14s. per ton, exclusive of the cost of mixing, bags, and bagging.

Notes.—The units have reference solely to the MARKET PRICES of Manures, and not to their AGRICULTURAL VALUES.

TABLE OF COMPENSATION VALUES FOR 1930.

TABLE SHOWING THE VALUE OF FEEDING-STUFFS AS MANURE PER TON, AND THE COMPENSATION VALUE PER TON OF FOOD CONSUMED, BASED ON THE AVERAGE UNIT PRICES OF FERTILISERS FOR 1930.

The following is a Table showing (under Section A) the average proportions of digested nitrogen, undigested nitrogen, phosphoric acid, and potash present in the feeding-stuffs named. The Table also shows the value per unit of nitrogen (digested and undigested), phosphoric acid, and potash, the prices per unit being the value per unit for compound manures prevailing for 1930. Under Section B of the Table is shown the compensation value per ton of food consumed for each of the feeding-stuffs named, based on the unit prices for 1930. Column (1) of Section B of the Table shows the value per ton recovered in dung; Col. (2) of the same section shows the value of the lasting part of dung per ton; while the remaining three columns show the residual values per ton after one crop, two crops, and three crops have been removed.

In accordance with the decision arrived at by the Committee appointed by a representative meeting of Scottish agriculturists, who reported in September 1917 on the "Compensation for Manurial Improvements and Cumulative Fertility," under the Agricultural Holdings (Scotland) Act, 1908, the value of undigested nitrogen per ton as manure is calculated as being 70 per cent of the value of digested nitrogen. The residual value, after one crop has been removed, is taken as one-half of the original residual value. Residual values, after one crop has been removed, are reduced by one-half after each crop.

Foods.	VALUE PER					
	Digested Nitrogen.			Undigested Nitrogen.		
	Per cent in food.	Value at 10s. per unit.	Two-fifths value to manure.	Per cent in food.	* Value at 7s per unit.	Three-fourths value to manure
	(1)	(2)	(3)	(4)	(5)	(6)
Cotton-cake, decorticated	5.92	s. d. 59 2	s. d. 23 8	0.98	s. d. 6 10	s. d. 5 2
Cotton-cake, undecorticated	2.73	27 4	10 11	0.81	5 8	4 3
Linseed cake	4.08	40 10	16 4	0.67	4 8	3 6
Linseed	3.28	32 10	13 2	0.32	2 3	1 8
Soya-bean cake	6.10	61 0	24 5	0.75	5 3	3 11
Palm-nut cake	1.88	18 10	7 6	0.62	4 4	3 3
Cocoa-nut cake	2.65	26 6	10 7	0.75	5 3	3 11
Earth-nut cake	6.86	68 7	27 5	0.76	5 4	4 0
Rape cake	3.97	39 8	15 10	0.93	6 6	4 11
Beans	3.48	34 10	13 11	0.52	3 8	2 9
Peas	3.10	31 0	12 5	0.50	3 6	2 8
Wheat	1.49	14 11	6 0	0.31	2 2	1 8
Barley	1.16	11 7	4 8	0.49	3 5	2 7
Oats	1.52	15 2	6 1	0.48	3 4	2 6
Maize	1.22	12 2	4 10	0.48	3 4	2 6
Rice-meal	1.08	10 10	4 4	0.82	5 9	4 4
Locust beans	0.82	8 2	3 3	0.33	2 8	2 0
Malt	1.34	13 5	5 4	0.36	2 6	1 11
Malt culms	3.12	31 2	12 6	0.78	5 6	4 2
Bran	1.98	19 10	7 11	0.52	3 8	2 9
Brewers' and distillers' grains (dried)	2.34	23 5	9 4	0.96	6 9	5 1
Brewers' and distillers' grains (wet)	0.59	5 11	2 4	0.22	1 6	1 2
Dried distillery dreg	3.45	34 6	13 10	1.86	13 0	9 9
Clover hay	1.21	12 1	4 10	1.03	7 3	5 5
Meadow hay	0.88	8 10	3 6	0.62	4 4	3 3
Wheat straw	0.02	0 2	0 1	0.43	3 0	2 3
Barley straw	0.10	1 0	0 5	0.30	2 1	1 7
Oat straw	0.17	1 8	0 8	0.33	2 4	1 9
Mangolds	0.15	1 6	0 7	0.07	0 6	0 5
Swedes	0.16	1 7	0 8	0.09	0 8	0 6
Turnips	0.13	1 4	0 6	0.05	0 4	0 3
Fish-meal	8.03	80 10	32 4	0.90	6 4	4 9

* See last paragraph of explanatory note to the Table.

A.						B.						
TON AS MANURE.						COMPENSATION VALUE PER TON OF FOOD CONSUMED.						
Phosphoric Acid.			Potash.			†	†	Residual Value after				
Per cent in food	Value at 4s. 3d. per unit	Three-fourths value to manure.	Per cent in food.	Value at 4s. per unit	Three-fourths value to manure.	Value recovered in dung.	Value of lasting part of dung.	* (3) One crop.	* (4) Two crops.	* (5) Three crops.		
(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)		
	s. d.	s. d.		s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.
3.10	13 2	9 11	2.00	8 0	6 0	44 9	21 1	10 7	5 3	2 8		
2.00	8 6	6 5	2.00	8 0	6 0	27 7	16 8	8 4	4 2	2 1		
2.00	8 6	6 5	1.40	5 7	4 2	30 5	14 1	7 1	3 6	1 9		
1.54	6 7	4 11	1.37	5 6	4 2	23 11	10 9	5 5	2 8	1 4		
1.30	5 6	4 2	2.20	8 10	6 8	39 2	14 9	7 5	3 8	1 10		
1.20	5 1	3 10	0.50	2 0	1 6	16 1	8 7	4 4	2 2	1 1		
1.40	5 11	4 5	2.00	8 0	6 0	24 11	14 4	7 2	3 7	1 10		
2.00	8 6	6 5	1.50	6 0	4 6	42 4	14 11	7 6	3 9	1 10		
2.50	10 8	8 0	1.50	6 0	4 6	33 3	17 5	8 9	4 4	2 2		
1.10	4 8	3 6	1.30	5 2	3 11	24 1	10 2	5 1	2 7	1 3		
0.85	3 7	2 8	0.96	3 11	2 11	20 8	8 8	4 2	2 1	1 0		
0.85	3 7	2 8	0.53	2 1	1 7	11 11	5 11	3 0	1 6	0 9		
0.75	3 2	2 5	0.55	2 2	1 8	11 4	6 8	3 4	1 8	0 10		
0.60	2 7	1 11	0.50	2 0	1 6	12 0	5 11	3 0	1 6	0 9		
0.60	2 7	1 11	0.37	1 6	1 2	10 5	5 7	2 10	1 5	0 8		
0.60	2 7	1 11	0.37	1 6	1 2	11 9	7 5	3 9	1 10	0 11		
0.80	3 5	2 7	0.80	3 2	2 5	10 3	7 0	3 6	1 9	0 11		
0.80	3 5	2 7	0.60	2 5	1 10	11 8	6 4	3 2	1 7	0 10		
2.00	8 6	6 5	2.00	8 0	6 0	29 1	16 7	8 4	4 2	2 1		
2.70	11 6	8 8	1.45	5 10	4 5	23 9	15 10	7 11	4 0	2 0		
1 61	6 10	5 2	0 20	0 10	0 8	20 3	10 11	5 6	2 9	1 4		
0.42	1 9	1 4	0.05	0 2	0 2	5 0	2 8	1 4	0 8	0 4		
0.44	1 10	1 5	0.22	0 11	0 8	25 8	11 10	5 11	3 0	1 6		
0.57	2 5	1 10	1.50	6 0	4 6	16 7	11 9	5 11	2 11	1 6		
0.40	1 8	1 3	1.60	6 5	4 10	12 10	9 4	4 8	2 4	1 2		
0.24	1 0	0 9	0.80	3 2	2 5	5 6	5 5	2 9	1 4	0 8		
0.18	0 9	0 7	1.00	4 0	3 0	5 7	5 2	2 7	1 4	0 8		
0.24	1 0	0 9	1.00	4 0	3 0	6 2	5 6	2 9	1 5	0 8		
0.07	0 4	0 3	0.40	1 7	1 2	2 5	1 10	0 11	0 6	0 3		
0.06	0 3	0 2	0.22	0 11	0 8	2 0	1 4	0 8	0 4	0 2		
0.05	0 3	0 2	0.30	1 2	0 11	1 10	1 4	0 8	0 4	0 2		
7.24	30 9	23 1	0.50	2 0	1 6	61 8	29 4	14 8	7 4	3 8		

† The figures in column (13) are the sum of columns (3), (6), (9), and (12).

‡ The figures in column (14) are the figures in column (13) from which the corresponding figures in column (3) have been subtracted.

BOTANICAL DEPARTMENT

Consulting Botanist to the Society—(vacant)

The Society have fixed the following rates of charge for the examination of plants and seeds for the *bona fide* and individual use and information of members of the Society (not being seedsmen), who are particularly requested, when applying to the Consulting Botanist, to mention the kind of examination they require, and to quote its number in the subjoined schedule. The charge for examination must be paid at the time of application, and the carriage of all parcels must be prepaid.

Scale of Charges.

1. A report on the purity, amount, and nature of foreign materials, and the germinating power of a sample of seed, 1s.
2. Determination of the species of any weed or other plant, or of any vegetable parasite, with a report on its habits and the means for its extermination or prevention, 1s.
3. Report on any disease affecting farm crops, 1s.
4. Determination of the species of any natural grass or fodder plant, with a report on its habits and pasture or feeding value, 1s.

The Consulting Botanist's Reports are furnished to enable members—purchasers of seeds and corn for agricultural or horticultural purposes—to test the value of what they buy, and are not to be used or made available for advertising or trade purposes by seedsmen or otherwise.

Purchase of Seeds.

The purchaser should obtain from the vendor, by invoice or other writing, the proper designation of the seed he buys, with a guarantee of the percentage of purity and germination, and of its freedom from ergot, and in the case of clover, from the seeds of dodder or broom-rape.

It is strongly recommended that the purchase of *prepared mixtures* of seeds should be avoided. The different seeds should be purchased separately and mixed by the farmer: mixtures cannot be tested for germination.

The Sampling of Seeds.

The utmost care should be taken to secure a fair and honest sample. This should be drawn from the bulk delivered to the purchaser, and not from the sample sent by the vendor.

When legal evidence is required, the sample should be taken from the bulk, and placed in a sealed bag in the presence of a witness. Care

should be taken that the sample and bulk be not tampered with after delivery, or mixed or brought in contact with any other sample or bulk.

At least one ounce of grass and other small seeds should be sent, and two ounces of cereals and the larger seeds. When the bulk is obviously impure the sample should be at least double the amount specified. Grass seeds should be sent at least four weeks, and seeds of clover and cereals two weeks, before they are to be used.

The exact name under which the sample has been sold and purchased should accompany it.

Reporting the Results.

The Report will be made on a schedule in which the nature and amount of impurities will be stated, and the number of days each sample has been under test, with the percentage of the seeds which have germinated.

"Hard" clover seeds, though not germinating within the time stated, will be considered good seeds, and their percentage separately stated.

The impurities in the sample, including the chaff of the species tested, will be specified in the schedule, and only the percentage of the pure seed of that species will be reported upon; but the REAL VALUE of the sample will be stated. The Real Value is the combined percentages of purity and germination, and is obtained by multiplying these percentages and dividing by 100: thus in a sample of Meadow Fescue having 88 per cent purity and 95 per cent germination, 88 multiplied by 95 gives 8360, and this divided by 100 gives 83.6, the Real Value.

Selecting Specimens of Plants.

The whole plant should be taken up and the earth shaken from the roots. If possible the plants must be in flower or fruit. They should be packed in a light box, or in a firm paper parcel.

Specimens of diseased plants or of parasites should be forwarded as fresh as possible. They should be placed in a bottle, or packed in tinfoil or oil-silk.

All specimens should be accompanied with a letter specifying the nature of the information required, and stating any local circumstances (soil, situation, &c.) which, in the opinion of the sender, would be likely to throw light on the inquiry.

Parcels or letters containing seeds or plants for examination (carriage or postage paid) must be addressed to

NOTE.—*Members are reminded that seeds may now be tested at the Department of Agriculture for Scotland Seed-testing Station. Samples should be addressed to Mr Anderson, SEED-TESTING STATION, East Craigs, Corstorphine, Midlothian.*

ENTOMOLOGICAL DEPARTMENT

Consulting Entomologist to the Society—Dr R. STEWART MACDOUGALL,
Ivy Lodge, Gullane.

Arrangements have been made with Mr R. Stewart MacDougall, M.A., D.Sc., Gullane, to advise members of the Society regarding insects or allied animals which, in any stage of their development, infest—

- | | |
|-----------------------------------|-------------------------------------|
| (a) Farm crops. | (d) Fruit and fruit trees. |
| (b) Stored grain. | (e) Forest trees and stored timber. |
| (c) Garden and greenhouse plants. | (f) Live stock (including poultry). |

Members consulting Dr MacDougall should forward with their queries examples of the injured plants, or the injured parts of plants, &c., as well as specimens of the insects or other animals believed to be the cause of the injury.

Specimens should be sent in tin or wooden boxes, or in quills, to prevent injury in transmission.

Address letters and parcels (carriage or postage paid) to Dr R. Stewart MacDougall, Ivy Lodge, Gullane.

The Directors have fixed the fee payable by members to Dr MacDougall at 1s. for each case upon which he is consulted : this fee must be sent to him along with the application for information.

PREMIUMS

GENERAL REGULATIONS FOR COMPETITORS.

1. It is to be distinctly understood that the Society is not responsible for the views, statements, or opinions of any of the writers whose papers are published in the 'Transactions.'

2. All reports must be legibly written, and on one side of the paper only; they must specify the number and subject of the Premium for which they are in competition; they must bear a distinguishing motto, and be accompanied by a sealed letter, similarly marked, containing the name and address of the reporter—initials must not be used.

3. No sealed letter, unless belonging to a report found entitled to the Premium offered, or a portion of it, will be opened without the author's consent.

4. Reports for which a Premium, or a portion of a Premium, has been awarded, become the property of the Society, and cannot be published in whole or in part, nor circulated in any manner, without the consent of the Directors. All other papers will be returned to the authors if applied for within twelve months.

5. The Society is not bound to award the whole or any part of a Premium.

6. All reports must be of a practical character, containing the results of the writer's own observation or experiment, and the special conditions attached to each Premium must be strictly fulfilled. General essays, and papers compiled from books, will not be rewarded or accepted. Weights and measurements must be indicated by the imperial standards.

7. The Directors, before or after awarding a Premium, shall have power to require the writer of any report to verify the statements made in it.

8. The decisions of the Board of Directors are final and conclusive as to all matters relating to Premiums, whether for Reports or at General or District Shows; and it shall not be competent to raise any question or appeal touching such decisions before any other tribunal.

9. The Directors will welcome papers from any Contributor on any suitable subject, whether included in the Premium List or not; and if the topic and the treatment of it are both approved, the writer may be remunerated and his paper published.

CLASS I. REPORTS.

SECTION 1.—THE SCIENCE AND PRACTICE OF AGRICULTURE.

FOR APPROVED REPORTS.

1. On any useful practice in Rural Economy adopted in other countries, and susceptible of being introduced with advantage into Scotland—The Gold Medal. To be lodged by 1st November in any year.

The purpose chiefly contemplated by the offer of this premium is to induce travellers to notice and record such particular practices as may seem calculated to benefit Scotland. The Report to be founded on personal observation.

2. Approved Reports on other suitable subjects. To be lodged by 1st November in any year.

SECTION 2.—ESTATE IMPROVEMENTS.

FOR APPROVED REPORTS.

1. By the Proprietor in Scotland who shall have executed the most judicious, successful, and extensive Improvement—The Gold Medal, or Ten Sovereigns. To be lodged by 1st November in any year.

Should the successful Report be written for the Proprietor by his resident factor or farm manager, a Minor Gold Medal will be awarded to the writer in addition to the Gold Medal to the Proprietor.

The merits of the Report will not be determined so much by the mere extent of the improvements, as by their character and relation to the size of the property. The improvements may comprise reclaiming, draining, enclosing, planting, road-making, building, and all other operations proper to landed estates. The period within which the operations may have been conducted is not limited, except that it must not exceed the term of the Reporter's proprietorship.

2. By the Proprietor or Tenant in Scotland who shall have reclaimed within the ten preceding years not less than forty acres of Waste Land—The Gold Medal, or Ten Sovereigns. To be lodged by 1st November in any year.

3. By the Tenant in Scotland who shall have reclaimed within the ten preceding years not less than twenty acres of Waste Land—The Gold Medal, or Ten Sovereigns. To be lodged by 1st November in any year.

4. By the Tenant in Scotland who shall have reclaimed not less than ten acres within a similar period—The Medium Gold Medal, or Five Sovereigns. To be lodged by 1st November in any year.

The Reports in competition for Nos. 2, 3, and 4 may comprehend such general observations on the improvement of waste lands as the writer's

experience may lead him to make, but must refer especially to the lands reclaimed—to the nature of the soil—the previous state and probable value of the subject—the obstacles opposed to its improvement—the details of the various operations—the mode of cultivation adopted—and the produce and value of the crops produced. As the required extent cannot be made up of different patches of land, the improvement must have relation to one subject; it must be of profitable character, and a rotation of crops must have been concluded before the date of the Report. *A detailed statement of the expenditure and return and a certified measurement of the ground are requisite.*

5. By the Proprietor or Tenant in Scotland who shall have improved within the ten preceding years the Pasturage of not less than thirty acres, by means of top-dressing, draining, or otherwise, without tillage, in situations where tillage may be inexpedient—The Gold Medal, or Ten Sovereigns. To be lodged by 1st November in any year.

6. By the Tenant in Scotland who shall have improved not less than ten acres within a similar period—The Minor Gold Medal. To be lodged by 1st November in any year.

Reports in competition for Nos. 5 and 6 must state the particular mode of management adopted, the substances applied, the elevation and nature of the soil, its previous natural products, and the changes produced.

SECTION 3.—HIGHLAND INDUSTRIES AND FISHERIES.

FOR APPROVED REPORTS.

1. The best mode of treating native Wool; cleaning, carding, dyeing, spinning, knitting, and weaving by hand in the Highlands and Islands of Scotland—Five Sovereigns. To be lodged by 1st November in any year.

SECTION 4.—MACHINERY.

FOR APPROVED REPORTS.

To be lodged by 1st November in any year.

SECTION 5.—FORESTRY DEPARTMENT.

FOR APPROVED REPORTS.

1. On Plantations of not less than eight years' standing formed on deep peat-bog—The Medium Gold Medal, or Five Sovereigns. To be lodged by 1st November in any year.

The premium is strictly applicable to deep peat or flow moss; the condition of the moss previous to planting, as well as at the date of the Report, should, if possible, be stated.

The Report must describe the mode and extent of the drainage, and the effect it has had in subiding the moss—the trenching, levelling, or other preliminary operations that may have been performed on the surface—the mode of planting—kinds, sizes, and number of trees planted per acre—and their relative progress and value, as compared with plantations of a similar age and description grown on other soils in the vicinity.

CLASS II.

DISTRICT COMPETITIONS.

REGULATIONS, 1930.

Grants in aid of DISTRICT COMPETITIONS for 1931 must be applied for before 1st November 1930, on Forms to be obtained from the Secretary.

When a Money Grant has expired, the District cannot apply again for another Money Grant for four years.

1. GRANTS TO DISTRICT SOCIETIES FOR HORSES, CATTLE, SHEEP, AND PIGS.

1. CLASS OF STOCK—LIMIT OF GRANTS, £340.—The Highland and Agricultural Society will make Grants to District Societies for prizes for *Breeding Animals* of any of the following Classes of Stock, viz. :—

<i>Cattle.</i>	<i>Sheep.</i>
Shorthorn.	Blackface.
Aberdeen-Angus.	Cheviot.
Galloway.	Border Leicester.
Belted Galloway.	Half-Bred.
Highland.	Shropshire.
Ayrshire.	Oxford-Down.
British-Friesian.	Suffolk.
Red Poll.	Wensleydale.
Jersey.	
Shetland.	<i>Pigs.</i>
<i>Horses.</i>	Any Pure Breed.
Draught Horses.	
Hunters.	
Hackneys.	
Ponies.	
Shetland Ponies.	

Cross-bred¹ animals are not eligible. The Prizes must be confined to *Breeding Animals*; "bullocks," "geldings," "wethers," and "hog pigs" are excluded.

2. All Competitions must be at the instance of a local Society. A Committee of Management shall be appointed, and the Convener of the Committee must be a Member of the Highland and Agricultural Society.

3. GRANT TO DISTRICT, £12.—The portion of the Grant to any one District Society shall not exceed the sum of £12 in any one year.

4. ALLOCATION OF GRANT.—The Grant from the Highland and Agricultural Society is not to be applied as a Grant in aid of the Premiums offered by the Local Society, but must be offered in the form of separate Prizes for the Animals chosen; and the Prizes must be announced in the Premium List and Catalogue of the Show as "given by the Highland and Agricultural Society."

5. CONTINUANCE OF GRANT—THREE YEARS.—The Money Grant shall continue for three alternate years, provided always that the District Society shall, in the two intermediate years, continue the competition by offering Premiums for the same class of Stock as that selected in each

¹ Exceptions to this rule may, however, be authorised by the Board of Directors, on application. The Directors are prepared to consider applications from local Societies which desire to use their grants, or part thereof, as prizes for cross-bred calves and one-year-old cross-bred cattle.

previous year to compete for the Highland and Agricultural Society's Prizes. If no competition takes place for two years the Grant expires.

6. When it is agreed to hold the General Show of the Society in any district, no provincial show shall be held in that district in the **three months** immediately preceding the date of the General Show. **Any infringement of this Rule shall entail cancellation of the grant.**

7. **MEDALS IN INTERMEDIATE YEARS.**—In the two alternate years the Highland and Agricultural Society will place three Silver Medals at the disposal of the District Societies, for the same classes of Stock as those for which the Money Premiums are offered, provided that not less than three lots are exhibited in the same class.

8. **RULES OF COMPETITION.**—The Rules of Competition for the Premiums, the Funds for which are derived from Grants of the Highland and Agricultural Society, shall be such as are generally enforced by the Society receiving the Grant for Premiums offered by itself.

9. **AREA AND PARISHES—FIVE PARISHES.**—When making application for Grants from the Highland and Agricultural Society, the District Society must delineate the area and the number of parishes comprised in the district, and, *except in special cases*, no District Society shall be entitled to a Grant whose show is not open to at least *five* Parishes.

10. **REPORTS.**—Blank Forms for Reports will be furnished to the Secretaries of the different District Societies. Both in the years when the Grant is offered and in the **two intermediate years**, detailed reports of the competition must be given on these Forms and lodged with the Secretary of the Highland and Agricultural Society as soon as possible after the Show, and in no case later than **1st November**. These reports are subject to the approval of the Directors of the Highland and Agricultural Society, against whose decision there shall be no appeal. All Reports must be signed and certified as marked in the Form. The Grant will lapse if no Report is lodged.

11. **GRANTS—WHEN PAID.**—The Grants made to District Societies will be paid in December after the Reports of the awards of the prizes have been received and found to be in order and passed by the Board of Directors, the Money Grants being paid to the Secretaries of the Local Societies and the Medals sent direct to the winners. *The Secretary of the District Society must not on any condition whatever pay any premium offered by the Highland and Agricultural Society until he has been informed that the awards are in order and has received the Grant from the Highland and Agricultural Society.*

12. **RENEWAL OF APPLICATION.**—No application for renewal of a Money Grant to a District Society will be entertained until the expiration of *four years* from the termination of the last Grant.

13. **DISPOSAL OF APPLICATIONS.**—In disposing of applications for District Grants, the Directors of the Highland and Agricultural Society shall keep in view the length of interval that has elapsed since the expiration of the last Grant, giving priority to those District Societies which have been longest off the list.

DISTRICTS.

Final Year.

1. **INVERURIE AGRICULTURAL SOCIETY.**—*Convener*, James C. Innes, Duns-croft, Gartly; *Secretary*, W. R. Cockburn, Holm Cottage, Inverurie. Granted 1925. (In abeyance 1928, on account of Aberdeen Show.)
2. **YTHANSIDE FARMERS' CLUB.**—*Convener*, G. C. Milne, Inverebrie Mains, Ellon; *Secretary*, John Walker, Southside, The Square, Ellon. Granted 1925. (In abeyance 1927—not awarded.)

3. **ARRAN FARMERS' SOCIETY.**—*Convener*, James J. Morton, Machrie Farm, Isle of Arran; *Secretary*, R. W. Campbell, Bank House, Blackwaterfoot, Arran. Granted 1926.
4. **BUTE AGRICULTURAL SOCIETY.**—*Convener*, William M'Millan, Millbrae, Ascog; *Secretary*, Dugald M'Alister, Bank of Scotland, Rothesay. Granted 1926.
5. **CARRICK FARMERS' SOCIETY.**—*Convener*, Thomas Smith, The Castle, Maybole; *Secretaries*, J. & J. M. Gibson, Royal Bank, Maybole. Granted 1926.
6. **MULL AND MORVERN AGRICULTURAL SOCIETY.**—*Convener*, J. H. Munro Mackenzie of Calgary, Calgary, Isle of Mull; *Secretary*, A. M. Morrison, Kengharair, Tobermory, Isle of Mull. Granted 1926.
7. **STRATHDON AGRICULTURAL ASSOCIATION.**—*Convener*, Charles Christie, Estates Office, Strathdon; *Secretary*, William M'Robert, Culfork, Strathdon. Granted 1926.
8. **STRATHSPEY FARMERS' CLUB.**—*Convener*, D. M. Allan, Ballintomb, Grantown-on-Spey; *Secretary*, John G. MacDougall, Dunolly, Grantown-on-Spey. Granted 1926.

2nd Year.

9. **CLACKMANNANSHIRE UNION AGRICULTURAL SOCIETY.**—*Convener*, John W. Prentice, Craigmie, Clackmannan; *Hon. Secretary*, G. F. Piggott, Union Street, Alloa. Granted 1927. (In abeyance 1929, on account of Alloa Show.)
10. **DALBEATTIE AGRICULTURAL SOCIETY.**—*Convener*, Major Wellwood Maxwell of Kirkennan, Dalbeattie; *Secretary*, J. E. Milligan, The Clydesdale Bank, Limited, Dalbeattie. Granted 1928.
11. **MEIKLEOUR AND DISTRICT AGRICULTURAL ASSOCIATION.**—*Convener*, David Fernie, Lochside, Coupar-Angus; *Secretary*, John Leggat, Meikleour, Perthshire. Granted 1928.

1st Year.

12. **KENNETHMONT AGRICULTURAL ASSOCIATION.**—*Convener*, Charles E. N. Leith-Hay, Leith Hall, Kennethmont; *Secretary*, John Reid, Benview, Kennethmont. Granted 1930.
13. **MAR AGRICULTURAL ASSOCIATION.**—*Convener*, Alexander Cumming, Kirkton, Dyce; *Secretary*, Peter Morrison, Blackchambers, Kinellar. Granted 1930.
14. **UPPER DEESIDE AGRICULTURAL ASSOCIATION.**—*Convener*, Robert Carr, Balnacraig, Kincardine O'Neil; *Secretary*, George J. Wilson, Bank Agent, Torphins. Granted 1930.
15. **MID-ARGYLL AGRICULTURAL SOCIETY.**—*Convener*, J. G. Mathieson, Poltalloch Estate Office, Kilmartin; *Secretary*, Neil L. M'Vicar, Poltalloch Estate Office, Kilmartin. Granted 1930.
16. **GIRVAN DISTRICT AGRICULTURAL SOCIETY.**—*Convener*, William K. Bone, Shalloch Park, Girvan; *Secretary*, Miss J. W. Kennedy, Town Clerk's Chambers, Girvan. Granted 1930.
17. **DUNBARTONSHIRE AGRICULTURAL SOCIETY.**—*Convener*, Captain A. J. Campbell Colquhoun, of Garscadden, Drimichapel; *Secretary*, George Lawrence, Union Bank of Scotland, Ltd., Dunbarton. Granted 1930.
18. **GATEHOUSE DISTRICT AGRICULTURAL SOCIETY.**—*Convener*, Mrs Murray-Usher, of Cally, Gatehouse-of-Fleet; *Secretary*, Thomas Mackenzie, Cally Mains, Gatehouse-of-Fleet. Granted 1930.

19. CARNWATH AGRICULTURAL SOCIETY.—*Convener*, Andrew S. Lawson, Guildhouse, Forth; *Secretary*, J. D. Mackintosh, Commercial Bank of Scotland, Ltd., Carnwath. Granted 1930.
20. DALKEITH AGRICULTURAL SOCIETY.—*Convener*, John M'Kean, Dalhousie Farm, Bonnyrigg; *Secretary*, William Carnegie, Auction Mart, Dalkeith. Granted 1930.
21. SPEY, AVEN, AND FIDDICHESIDE FARMER CLUB.—*Convener*, Sir John R. Findlay, Bart., K.B.E., of Aberlour; *Secretary*, R. D. Stuart, Seafield Square, Rothes. Granted 1930.
22. BUCHLYVIE AND GARTMORE AGRICULTURAL ASSOCIATION.—*Convener*, James Stewart, Cashley, Buchlyvie; *Secretary*, James Monach, Craignorton, Buchlyvie. Granted 1930.
23. GARGUNNOCK FARMERS' CLUB.—*Convener*, John Risk, Culmore, Kippen; *Secretary*, James Risk, Culmore, Kippen. Granted 1930.

(In Intermediate Year—3 Silver Medals.)

24. UNITED EAST LOTHIAN AGRICULTURAL SOCIETY.—*Convener*, A. G. Spence, Longyester, Gifford; *Secretary*, William Burnet, Solicitor, Haddington. Granted 1926. (In abeyance 1927, on account of Edinburgh Show.)
25. ARDOCH AGRICULTURAL SOCIETY.—*Convener*, H. Adam, 8 Viewfield Place, Stirling; *Secretary*, James Forbes, Al Arish, Braco. Granted 1927.
26. BERWICKSHIRE AGRICULTURAL ASSOCIATION.—*Convener*, Moffat S. Thomson, Lambden, Greenlaw; *Secretary*, Allen Turnbull, Swinton Bridgend, Duns. Granted 1927.
27. GLENKENS AGRICULTURAL SOCIETY.—*Convener*, Sydney C. Bristowe of Craig, Balmaclellan; *Secretary*, J. M. Garmory, Pomona Terrace, New Galloway. Granted 1927.
28. ISLAY, JURA AND COLONSAY AGRICULTURAL ASSOCIATION.—*Convener*, Hugh Morrison, M.P., of Islay, Islay; *Secretary*, Iain M. Mactaggart, Royal Bank Buildings, Bowmore, Islay. Granted 1927.
29. STRATHBOGIE FARMER CLUB.—*Convener*, James C. Innes, Dunscoft, Gartly; *Secretary*, John Stuart, Commercial Bank Buildings, Huntly. Granted 1927. (In abeyance 1928 and 1929—not awarded.)
30. BATHGATE AGRICULTURAL ASSOCIATION.—*Convener*, James W. Adamson, The Inch, Bathgate; *Secretary*, William Renton, Furbar, Arinadale. Granted 1928. (In abeyance 1929—not awarded.)
31. CROMAR, UPPER DEE, AND DONSIDE AGRICULTURAL SOCIETY.—*Convener*, Charles Strachan, Tillyorn, Corse, Lumphanan; *Secretary*, William Anderson, Home Farm, Hopewell, Tarland. Granted 1929.
32. MONKWOOD AND MINISHANT DISTRICT SOCIETY.—*Convener*, Colonel Norman Kennedy, D.S.O., Doonholm, Ayr; *Secretary*, Walter Gardner, M.R.C.V.S., Woodside, Maybole. Granted 1929.
33. UPPER WARD OF LANARKSHIRE AGRICULTURAL ASSOCIATION.—*Convener*, Andrew S. Lawson, Guildhouse, Forth; *Secretary*, Robert Pate, Royal Bank, Lanark. Granted 1929.
34. MOUNT BLAIR AGRICULTURAL SOCIETY.—*Convener*, John Mitchell, Bleaton, Blairgowrie; *Secretary*, Alexander F. M'Intosh, Dunay, Blackwater, Blairgowrie. Granted 1929.
35. FORTMARTINE AGRICULTURAL ASSOCIATION.—*Convener*, James Argo, of Tillymaud, Udney; *Secretary*, James Skinner, Hawklaw, Ellon. Granted 1929.

In abeyance 1930.

36. ANNAN AND DISTRICT AGRICULTURAL SOCIETY.—*Convener*, John Roddick, Greenbank, Annan; *Secretary*, James Risk, Kinmount Estate Office, Annan. Granted 1928.
37. MOFFAT AND UPPER ANNANDALE AGRICULTURAL AND HORTICULTURAL SOCIETY.—*Convener*, C. C. Hyslop, Kirkhill, Johnstone Bridge; *Secretary*, John H. Edgar, Beech Cottage, Moffat. Granted 1928. (In abeyance 1928—No Show held.)
38. LOCKERBIE AGRICULTURAL SOCIETY.—*Convener*, D. J. Bell-Irving, Annandale House, Lockerbie; *Secretary*, Thomas Henderson, Solicitor, Lockerbie. Granted 1929.

In 1930.

Nos. 1, 2, 3, 4, 5, 6, 7, and 8 are in competition for the final year.

Nos. 9, 10, and 11 are in competition for the second year.

Nos. 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, and 23 are in competition for the first year.

Nos. 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, and 35 are in intermediate year and compete for local Premiums. (See Rules 5 and 7.)

Nos. 36, 37, and 38 are in abeyance on account of the Dumfries Show.

2. GRANTS TO HORSE ASSOCIATIONS, &c., FOR STALLIONS FOR AGRICULTURAL PURPOSES.

1. The Highland and Agricultural Society will make Grants to Horse Associations and other Societies in different districts engaging Stallions for agricultural purposes. The total sum expended by the Highland and Agricultural Society in such Grants shall not exceed the sum of £210 in any one year.

2. The portion of the Grant to any one Association or Society shall not exceed the sum of £15 in any one year.

3. The Grant will be available only for Stallions which, for the year to which the Grant applies, are Registered in the Register of Certified Draught Stallions published by the Board of Agriculture. (For information regarding the Registration of Stallions, apply to the Secretary of the Ministry of Agriculture and Fisheries, 10 Whitehall Place, London, S.W.)

4. The Grant will continue for three years provided the Association receiving the Grant shall hire a Registered Stallion in the two intermediate years.

5. In the event of a Horse not being engaged in any one year while the provisions of the Grant are in force, the Grant made by the Highland and Agricultural Society will cease.

6. RULES 2 (Committee and Convener), 10 (Reports), 11 (Time of Payment), 12 (Renewal of Grant), and 13 (Disposal of Applications) applicable to Section 1, shall be applicable to this Section.

*DISTRICTS.***Final Year.**

1. BUCHLYVIE AND VALE OF MENTEITH HORSE-BREEDING AND STOCK IMPROVEMENT SOCIETY, LIMITED.—*Convener*, Thomas Syme, Shirkurton, Kippen; *Secretary*, Miss M. M. Drysdale, 55 Colinton Road, Edinburgh. Granted 1926
2. CENTRAL FORFARSHIRE HORSE-BREEDING SOCIETY.—*Convener*, James Scott, Ascurry, Letham, Forfar; *Secretary*, Walter R. Findlay, Ochterlony Mains, Guthrie. Granted 1926.

3. EAST MAINLAND CO-OPERATIVE HORSE-BREEDING SOCIETY, LIMITED.—*Convener*, Alexander Calder, Sebay, Tankerness, Kirkwall; *Secretary*, David J. Laughton, Castle, Quoyburay, Kirkwall. Granted 1926.

2nd Year.

4. SOUTH DEESIDE STOCK IMPROVEMENT SOCIETY.—*Convener*, George Jamieson, Burnside, Netherley, Stonehaven; *Secretary*, John Duncan, Craiglug Cottage, Durriss. Granted 1928.

1st Year.

5. MID-ARGYLL AGRICULTURAL SOCIETY.—*Convener*, J. G. Mathieson, Pottaloch Estate Office, Kilmartin; *Secretary*, Neil L. M'Vicar, Pottaloch Estate Office, Kilmartin. Granted 1930.
6. UPPER WARD OF LANARKSHIRE AGRICULTURAL ASSOCIATION.—*Convener*, Andrew S. Lawson, Guildhouse, Forth; *Secretary*, Robert Pate, Royal Bank of Scotland, Lanark. Granted 1930.
7. MORAYSHIRE CLYDESDALE HORSE-BREEDING ASSOCIATION.—*Convener*, James P. Brown, Dipple, Fochabers; *Secretary*, William Thomson, 149 High Street, Elgin. Granted 1930.
8. SPEY, AVEN, AND FIDDICHSIDE FARMER CLUB.—*Convener*, Sir John R. Findlay, Bart., K.B.E., of Aberlour; *Secretary*, R. D. Stuart, Seafeld Square, Rothes. Granted 1930.
9. STIRLING DISTRICT CLYDESDALE HORSE SOCIETY.—*Convener*, James More, Woodyett, Gargunnoch; *Secretary*, Alexander Paterson, Solicitor, 62 Port Street, Stirling. Granted 1930.

Intermediate Year—Grant in Abeyance.

10. EAST LOTHIAN CLYDESDALE HORSE-BREEDING SOCIETY.—*Convener*, Charles H. Beveridge, Elphinstone Tower, Tranent; *Secretary*, W. Burnet, Solicitor, Haddington. Granted 1927.
11. KIRRIEMUIR DISTRICT AGRICULTURAL ASSOCIATION.—*Convener*, Oliver Turnbull, Baldoukie, Forfar; *Secretary*, M. B. Wallace, National Bank, Kirriemuir. Granted 1927.
12. ORKNEY WEST MAINLAND HORSE-BREEDING SOCIETY.—*Convener*, William Corrigan, North Bigging, Harray, Kirkwall; *Secretary*, John G. S. Flett, Nistaben, Harray, Kirkwall. Granted 1927.
13. NAIRNSHIRE FARMING SOCIETY.—*Convener*, Joseph Mackay, Glebe End, Nairn; *Secretary*, A. J. MacKintosh, St Colins, Auldearn, Nairn. Granted 1929.
14. ROUSAY AGRICULTURAL HORSE-BREEDING SOCIETY.—*Convener*, James H. Johnston, Trumland Farm, Rousay; *Secretary*, Thomas Sinclair, jun., Banks, Frotoft, Rousay, Orkney. Granted 1929.
15. SELKIRK AND GALASHIELS AGRICULTURAL SOCIETY.—*Convener*, John Elliot, Balnakiel, Galashiels; *Secretary*, John Hendrie, The Yair, Galashiels. Granted 1929.
16. SCOTTISH CENTRAL HORSE-BREEDING ASSOCIATION.—*Convener*, J. Ernest Kerr of Harviestoun, Dollar; *Secretary*, William Carrick, Newlands, Stirling. Granted 1929.

In 1930.

Nos. 1, 2, and 3 are in competition for the final year.

No. 4 is in competition for the second year.

Nos. 5, 6, 7, 8, and 9 are in competition for the first year.

Nos. 10, 11, 12, 13, 14, 15, and 16 are in abeyance, and compete for local Premiums. (See Rule 4.)

3. MEDALS IN AID OF PREMIUMS GIVEN BY LOCAL SOCIETIES.

The Society, being anxious to co-operate with local Associations, will give a limited number of Silver Medals annually to Societies, not on the list of Cattle, Horse, or Sheep Premiums, in addition to the Money Premiums awarded in the Districts, for—

1. Best Bull, Cow, or Heifer of any pure breed included in Section 1.
2. Best Stallion or Mare of any pure breed included in Section 1.
3. Best Tup or Pen of Ewes of any pure breed included in Section 1.
4. Best Boar, Sow, or Breeding-Pig of any pure breed.
5. Best Pens of Poultry.
6. Best Sample of any variety of Wool.
7. Best Sample of any variety of Seeds.
8. Best managed Farm.
9. Best managed Green Crop.
10. Best managed Hay Crop.
11. Best managed Dairy.
12. Best Sweet-Milk Cheese.
13. Best Cured Butter.
14. Best Fresh Butter.
15. Best collection of Roots.
16. Best kept Fences.
17. Best Sheep-Shearer.
18. Most expert Hedge-Cutter.
19. Most expert Labourer at Draining.
20. Best Maker of Oat-Cakes.

It is left to the local Society to choose out of the foregoing list the classes for which the Medals are to be competed.

RULES OF COMPETITION.

1. All Competitions must be at the instance of a local Society.
2. The classes for which Medals are granted must be in accordance with the list as shown above. The Committee shall select the classes, and specify them in the Report.
3. The Medals are granted for two years, and lapse if not awarded in those years.
4. No Society shall receive more than two Medals in any year.
5. A Committee of Management shall be appointed, and the Convener of the Committee must be a Member of the Highland and Agricultural Society.
6. When it is agreed to hold the General Show of the Society in any district, no provincial show shall be held in that district in the **three months** immediately preceding the date of the General Show. **Any infringement of this Rule shall entail cancellation of the grant.**
7. The Money Premiums given in the District must be not less than £2 for each Medal claimed.
8. The Medal for Sheep-Shearing shall always accompany the highest Money Premium.
9. There must not be fewer than three competitors in all the classes.
10. Regarding Reports and despatch of Medals, Rules 10 and 11, Section 1, will apply.
11. When a grant of Medals has expired, the District cannot apply again for Medals for two years.

Aberdeenshire.

1. ABERDOUR AND NORTH-EASTERN AGRICULTURAL ASSOCIATION.—*Convener*, M. J. Keith, Aberdour House, Fraserburgh; *Secretary*, W. W. Laing, The Mill Farm, New Aberdour, Fraserburgh. Granted 1929.

Banffshire.

2. THE NORTHERN SEEDS AND ROOTS ASSOCIATION.—*Convener*, James Green, Whyntie, Portsoy; *Secretary*, A. Bannerman Robb, M.A., B.L., 39 Seafeld Street, Portsoy. Granted 1929.

Lanarkshire.

3. SHOTTS CALDERWATERHEAD FARMERS' SOCIETY.—*Convener*, William Currie, Spindleside, Cleland; *Secretary*, Thomas Sommerville, 47 Bon Accord Crescent, Shotts. Granted 1930.

Orkney.

4. SOUTH RONALDSHAY AND BURRAY AGRICULTURAL SOCIETY.—*Convener*, John Tomison, Halcro, St Margaret's Hope; *Secretary*, George Esson, St Margaret's Hope, Orkney. Granted 1929.

Perthshire.

5. BLACKWATER, GLENSHEE, AND UPPER GLENISLA AGRICULTURAL ASSOCIATION.—*Convener*, John Mitchell, Bleaton, Blairgowrie; *Secretary*, Alexander F. M'Intosh, Dunay, Blackwater, Blairgowrie. Granted 1930.

Stirlingshire.

6. DENNY AND DUNIPACE AGRICULTURAL ASSOCIATION.—*Convener*, Andrew Dunn, Duncarron, Denny; *Secretary*, John M'Millan, 37 Stirling Street, Denny. Granted 1929.

Applications from other Districts must be lodged with the Secretary of the Society on or before the 1st November next.

4. SPECIAL GRANTS.

ANNUAL.

- £20 to the Ayrshire Agricultural Association, to be competed for at the Dairy Produce Show at Kilmarnock.—*Chairman of Directors*, Colonel W. T. R. Houldsworth of Kirkbride, Maybole; *Secretary*, John Howie, 58 Alloway Street, Ayr. Granted 1872.
- £20 to the Northern Arts and Crafts Society.—*Convener*, Miss G. H. Mackintosh, Raigmore, Inverness; *Joint-Secretaries*, Mrs Mitford, Berryfield, Lentrane, and Miss Mary Mackintosh, Raigmore, Inverness. Granted 1922.
- The British Dairymaids' Association.—*Convener*, Miss A. C. Spier, 52 Brownside Road, Cambuslang, Glasgow; *Secretary*, Miss J. Macdonald, 16 Rutland Square, Edinburgh. 1 Minor Gold Medal and 1 Medium Silver Medal for Champion Butter-making Competitions. Granted 1908.
- The Scottish National Union of Allotment Holders.—*Secretary*, Archibald W. Fisher, 18 Hill Street, Edinburgh. £8 and 8 Medium Silver Medals for best Allotments. Granted 1927.
- The North of Scotland College of Agriculture.—*Secretary*, A. A. Prosser. 3 Silver Medals (1 Large, 1 Medium, and 1 Minor)—1st, 2nd, and 3rd Prizes respectively—for Stackyard Competition (*Sir John Fleming Cup Competition*). Granted 1925.

IN ALTERNATE YEARS.—GRANTS IN 1930.

- £3 to Rousay Agricultural Society, Orkney.—*Convener*, James Johnston, Trumland, Rousay, Orkney; *Secretary*, Thomas Sinclair, jun., Banks, Fiotoft, Rousay, Orkney. Granted 1903.
- £3 to South Ronaldshay and Burray Agricultural Society, Orkney.—*Convener*, John Tomison, Halcro, St Margaret's Hope, Orkney; *Secretary*, George Esson, St Margaret's Hope, Orkney. Granted 1904.

GRANTS IN ABEYANCE, 1930.

- £3 to Orkney Agricultural Society.—*Convener*, J. M. H. Robertson, Lyking, Stromness; *Secretary*, D. B. Peace, 4 Old Scapa Road, Kirkwall, Orkney. Granted 1883.
- £3 to Sanday Agricultural Association, Orkney.—*Convener*, W. Cowper Ward, Scar House, Sanday, Orkney; *Secretary*, John Wallace, Prattsfauld, Sanday, Orkney. Granted 1902.
- £3 to East Mainland Agricultural Society, Orkney.—*Convener*, James G. Skea, Barns of Ayre, Deerness, Orkney; *Secretary*, David J. Laughton, Caastle, Quoyburray, Kirkwall, Orkney. Granted 1898.
- £3 to West Mainland Agricultural Society, Orkney.—*Convener*, George Learmonth, Pow, Sandwick; *Secretary*, James Wood, Garson, Sandwick, Stromness, Orkney. Granted 1900.

5. SCOTTISH WOMEN'S RURAL INSTITUTES.

A sum not exceeding £150 in each year will be given in special grants to Federations of Scottish Women's Rural Institutes. The amount of any one grant shall not exceed £10. Any Federation which has received a grant for two consecutive years shall not be eligible to again apply until after the expiry of two years.

- Caithness Federation of Scottish Women's Rural Institutes.—*Convener*, Mrs E. M. Brenner, Tofts, Freswick, Wick; *Secretary*, Miss A. S. M'I. Bain, Bowermadden, Bower, Wick. Granted 1929.
- Dumbartonshire Federation of Scottish Women's Rural Institutes.—*Convener*, Mrs H. I. C. Martin, Drumhead, Cardross; *Secretary*, Miss S. E. C. Lumsden, Duncryne, Gartocharn. Granted 1929.
- Inverness-shire County Federation of Scottish Women's Rural Institutes.—*Convener*, Miss E. C. Ryan, Blaracha, Roybridge; *Secretary*, Miss J. E. Shaw, Caberfeidh, Fort William. Granted 1929.
- Kincardineshire Federation of Scottish Women's Rural Institutes.—*Convener*, Mrs C. G. Cox, Inchmarlo, Banchory; *Secretary*, Miss E. G. Simpson, Whinhurst, Fordoun. Granted 1929.
- Orkney Federation of Scottish Women's Rural Institutes.—*Convener*, Mrs Leask, Sunnybank, St Ola, Orkney; *Secretary*, Miss J. Harvey, Wattle, Birsay, Orkney. Granted 1929.
- Perth and Kinross Federation of Scottish Women's Rural Institutes.—*Convener*, Mrs M. W. Fairweather, The Elms, Meigle; *Secretary*, Mrs I. Struthers, Schoolhouse, Meigle. Granted 1929.
- Sutherland Federation of Scottish Women's Rural Institutes.—*Convener*, Mrs Serjeantson, Troughend, Brora; *Secretary*, Mrs A. V. Grant, Pulrossie Farn, Dornoch. Granted 1929.
- Aberdeen County Federation of Scottish Women's Rural Institutes.—*Convener*, Mrs Moir-Byres, Tonley, Whitehouse; *Secretary*, Miss A. Henderson, 25 Crown Street, Aberdeen. Granted 1930.

CLASS III.

COTTAGES AND GARDENS.

The following Premiums are offered for Competition in the Parishes after-mentioned.

The Premiums are granted for two years.

1. PREMIUMS FOR BEST KEPT COTTAGES AND GARDENS

1. Best kept Cottage	.	.	.	.	.	£1	0	0
Second best	.	.	.	.	.	0	10	0
2. Best kept Cottage Garden	.	.	.	.	.	1	0	0
Second best	.	.	.	.	.	0	10	0

RULES OF COMPETITION.

1. Competitions may take place in the different parishes for Cottages and Gardens, or for either separately.

2. The occupiers of Lodges at Gentlemen's Approach Gates and Gardeners' Houses are excluded, as well as others whom the Committee consider, from their position, not to be entitled to compete. The inspection must be completed by the 1st of October. In making the inspection, the Conveners may take the assistance of any competent judges.

3. It shall be left to the Committee of the District to fix two grades of Cottages, with maximum rents of £6 and £15 respectively, and to apply for £3 Grants in respect of each.

4. To warrant the award of full Premiums, there must not be fewer than three competitors in each class. If there are less than three competitors in each class, only half Premium will be awarded.

5. A person who has gained the highest Premium cannot compete again.

6. If the Cottage is occupied by the proprietor, the roof must be in good repair; if the roof is thatch, it must be in good repair, though in the occupation of a tenant. The interior and external conveniences must be clean and orderly; the windows must be free of broken glass, clean, and affording the means of ventilation. Dunghills, and all other nuisances, must be removed from the front and gables. In awarding the Cottage Premiums, preference will be given to Competitors who, in addition to the above requisites, have displayed the greatest taste in ornamenting the exterior of their houses, and the ground in front and at the gables.

7. In estimating the claims for the Garden Premiums, the judges should have in view—the sufficiency and neatness of the fences and walks; the cleanness of the ground; the quality and choice of the crops; and the general productiveness of the garden.

8. Reports, stating the number of Competitors, the names of successful parties, and the nature of the exertions which have been made by them, must be lodged with the Secretary of the Highland and Agricultural Society on or before the 1st November next.

9. When a grant of Money has expired, the District cannot apply again for aid for four years.

Parishes desirous of these Premiums must lodge applications with the Secretary *on or before the 1st November next.*

Largo and Newburn Horticultural Society.—*President*, Miss Baxter, The Grove, Upper Largo; *Secretary*, John Baird, Balmore, Lundin Links. Granted 1930.

2. MEDALS FOR COTTAGES AND GARDENS, OR GARDEN PRODUCE, POULTRY, AND BEE-KEEPING.

1. The Society will give annually one or two Minor Silver Medals to a limited number of local Associations or individuals, who establish Competitions and Premiums for Cottages, Gardens, Garden Produce, or Bee-Keeping. The Medals will be granted for two years.

2. The Medals may be offered in any two of the following sections, *but under no circumstances will the two Medals be given in one of the sections:—*

(1) Best kept Cottage or best kept Cottage and Garden. (One Medal only.)

(2) Best kept Garden. (One Medal only.)

(3) Best Collection of Garden Produce—Flowers excluded. (One Medal only.)

(4) Best Pen of Poultry.

(5) Honey. (One Medal only.)

3. The annual value of each Cottage, with the ground occupied in the parish by a Competitor, must not exceed £20. The occupiers of Lodges at Gentlemen's Approach Gates, and Gardeners in the employment of others, are not entitled to compete.

4. If Competition takes place for Garden Produce, such produce must be *bona fide* grown in the Exhibitor's Garden. He will not be allowed to make up a collection from any other Garden. The produce must consist of Vegetables, or Vegetables and Fruit (not Fruit alone). Flowers are excluded.

5. The Honey must be the produce of the Exhibitor's own Hives.

6. To warrant the award of a Medal, there must not be fewer than three Competitors.

7. Blank forms for Reports of Competitions will be furnished to the Secretaries of the different Districts. These must, in all details, be completed and lodged with the Secretary of the Highland and Agricultural Society as soon as possible after the Show, and in no case later than *1st November*, for the approval of the Directors, against whose decisions there shall be no appeal.

8. When a grant of Medals has expired, the District cannot apply again for aid for two years, and if no competition takes place in a District for two years the grant expires.

9. Applications for these Medals must be made *on or before the 1st November next.*

1. Springside Horticultural and Agricultural Society.—*President*, John Lyon, Springhill Farm, Springside, Kilmarnock; *Secretary*, William Scott, Kirkland Cottage, Springside, Kilmarnock. Granted 1930.

2. Dunbartonshire Agricultural Society.—*Convener*, Captain A. J. Campbell Colquhoun, of Garscadden, Drumchapel; *Secretary*, George Lawrence, Union Bank of Scotland, Ltd., Dunbarton. Granted 1930.
3. Largo and Newburn Horticultural Society.—*President*, Miss Baxter, The Grove, Upper Largo; *Secretary*, John Baird, Balmore, Lundin Links. Granted 1930.
4. Kilmarnock and District Horticultural Society.—*President*, Major David Yuille, Burns Avenue, Kilmarnock; *Secretary*, John S. Fergusson, B.Sc., 25 Grainger Road, Riccarton, Kilmarnock. Granted 1930.

CLASS IV.

PLOUGHING, HOEING, AND LONG SERVICE.

1. PLOUGHING COMPETITIONS.

The Ploughing Medal will be given to the winner of the first Premium at Ploughing Competitions, provided a Report in the following terms on the official form is made to the Secretary, within one month of the Competition, by a Member of the Society. Forms of Report to be had on application.

FORM OF REPORT.

I, _____ of _____, Member of the Highland and Agricultural Society, hereby certify that I attended the Ploughing Match of the _____ Association at _____ in the county of _____ on the _____ when _____ ploughs competed; _____ of land were assigned to each, and _____ hours were allowed for the execution of the work. The sum of £ _____ was awarded as follows :—

[*Here enumerate the names and designations of successful Competitors.*]

RULES OF COMPETITION.

1. All Matches must be at the instance of a local Society or Ploughing Association, and no Match at the instance of an individual, or confined to the tenants of one estate, will be recognised.
2. The title of such Society or Association, together with the name and address of its Secretary, must be registered with the Secretary of the Highland and Agricultural Society, 8 Eglinton Crescent, Edinburgh.
3. Not more than one Match in the same season can take place within the bounds of the same Society or Association.
4. All reports must be lodged within one month of the date of the Match, and certified by a Member of the Highland and Agricultural Society who was present at it.

5. A Member can report only one Match ; and a Ploughman cannot carry more than three Medals in the same season.

6. To warrant the grant of the Medal, there must have been 12 Ploughs in actual competition for the medal (*i.e. in the particular class for which the medal was offered*) and not less than £3 awarded in Prizes by the Local Society. The Medal to be given to the winner of the first prize.

7. The Local Society or Ploughing Association shall decide what class of ploughs shall compete for the Medal, and if so agreed, may offer it for competition to the class of plough most generally in use in the district.

8. The Local Society or Committee may, if they desire, arrange to let each Ploughman have one person to guide the horses for the first two and the last two furrows, but in no case shall Ploughmen receive any other assistance, and their work must not be set up or touched by others. Attention should be given to the firmness and sufficiency of the work below, more than to its neatness above the surface.

9. The Local Committee is required to fix the time to be allowed for ploughing the portion of land, and they are recommended that the time be at the rate of not more than fourteen hours per imperial acre on light land, and eighteen hours on heavy or stony land.

NOTE.—The attention of the Directors of the Society has frequently been drawn to certain irregularities which have occurred in connection with the conduct of Ploughing Matches and the completion of the Reports thereon. Complaints have been made (a) that the allotted amount of ground has not been ploughed, within the specified time, by the competitor awarded the first prize ; (b) that the Report sent to this Society has been signed by a Member of the Society who was not present at the Match. It has to be pointed out that any infringement of the above Rules by a Local Society or Ploughing Association will render that Society or Association liable, at the discretion of the Board of Directors, to be debarred from receiving the Society's Medals in future.

2. HOEING COMPETITIONS.

The Minor Silver Medal will be given to the winner of the first Premium at Hoeing Competitions, provided a Report in the following terms on the official form is made to the Secretary within a month of the Competition by a Member of the Society. Forms of Report to be had on application.

RULES OF COMPETITION.

1. All Matches must be at the instance of a local Society or Hoeing Association, and no Match at the instance of an individual, or confined to the tenants of one estate, will be recognised.

2. The title of such Society or Association, together with the name and address of its Secretary, must be registered with the Secretary of the Highland and Agricultural Society, 8 Eglinton Crescent, Edinburgh.

3. Not more than one Match in the same season can take place within the bounds of the same Society or Association.

4. All reports must be lodged within one month of the date of the Match, and certified by a Member of the Highland and Agricultural Society who was present at it.

5. A Member can only report one Match ; and same Competitor cannot carry more than three Medals in the same season.

6. To warrant the grant of the Medal there must have been twelve hoes in Competition, and not less than Three Pounds awarded in prizes

by the local Society. The Medal to be given to the winner of the first prize.

7. The time to be allowed to be decided by the local Committee, but in no case to exceed two hours for two drills of 100 yards each, the third drill being unoccupied, so that Competitors do not interfere with their neighbour's work.

8. Competitors must finish their work as they go along—no turning back or after-dressing allowed. Handpicking or transplanting shall be strictly prohibited.

9. A Committee shall be appointed to watch the work, and any Competitor found transplanting or otherwise not complying with the Rules shall have his number withdrawn, and be debarred from receiving any prize which might otherwise have been awarded to him.

NOTE.—Medals will be awarded under similar conditions for Competitions in hand-singling.

3. LONG-SERVICE CERTIFICATES AND MEDALS.

Certificates and Silver Medals for long service are awarded by the Society to farm servants, male or female, having an approved service in Scotland of not less than thirty years—(a) with one employer on the same or different holdings; (b) on the same holding with different employers. Special Certificates and Gold Medals are also awarded to farm servants, male or female, having an approved service in Scotland of not less than forty-five years, on similar conditions of employment as the above. These Certificates and Medals will be issued as applications are received.

Forms to be obtained from the Secretary.

War Service to count towards the time required for qualification, where farm servants have returned to same service or employment with same farmer or his family.

Estate workers, such as Foresters, Carters, Grooms, &c., are not eligible. The award is strictly confined to Farm workers, such as Ploughmen, Shepherds, &c.

NOTE.—From 15th to 24th July all communications should be addressed to "The Secretary, Secretary's Office, Showyard, Dumfries."

Address for Telegrams—"SOCIETY," EDINBURGH.
Telephone No.—EDINBURGH 23855.

HIGHLAND AND AGRICULTURAL SOCIETY OF SCOTLAND

GENERAL SHOW OF STOCK, IMPLEMENTS AND MACHINERY DUMFRIES

22ND, 23RD, 24TH, AND 25TH JULY 1930.

LAST DAYS OF ENTRY.

IMPLEMENTS AND OTHER ARTICLES—Monday, 5th May.

CATTLE, HORSES, SHEEP, GOATS, AND PIGS—Thursday, 29th May.
(*Separate Form for EACH Entry.*)

POULTRY, DAIRY PRODUCE, WOOL, RURAL INDUSTRIES, AND HORSE-SHOEING—Thursday, 29th May.

RABBITS, HONEY, AND STOCK JUDGING COMPETITION—Thursday, 19th June.

No Entry at ordinary fees taken later than those which are received at the Society's Office, Edinburgh, by first post, or 10 o'clock, on Friday morning, 30th May. Late Entries for Cattle, Horses, Sheep, Goats, and Pigs taken on payment of 10s. additional for each entry (Poultry, Dairy Produce, Wool, Rural Industries, and Horse-shoeing at double fees) till 10 o'clock on Wednesday morning, 4th June, at the Society's Office, Edinburgh.

President of the Society.

THE DUKE OF BUCCLEUCH AND QUEENSBERRY, K.T.

Chairman of the Board of Directors.

J. E. KERR OF HARVIESTOUN, DOLLAR.

Convenor of the Local Committee.

COLONEL F. J. CARRUTHERS OF DORMONT, LOCKERBIE.

The District connected with the Show comprises the Counties of Dumfries Kirkcudbright, and Wigtown.

REGULATIONS.

GENERAL CONDITIONS.

1. The Competition, except where otherwise stated in the Premium List, is open to Exhibitors from all parts of Great Britain, Northern Ireland, and Irish Free State.

Entries

2. Every Lot must be intimated by a Certificate of Entry, lodged with the Secretary not later than Monday, 5th May, for Implements and other Articles; Thursday, 29th May, for Stock, Poultry, Dairy Produce, Wool, Rural Industries, and Horse-shoeing; Thursday, 19th June, for Rabbits, Honey, and Stock-Judging Competition. No Entry taken at ordinary fees later than those which are received at the Society's Office by first post, or 10 o'clock, on Friday morning, 30th May. Late Entries for Cattle, Horses, Sheep, Goats, and Pigs taken on payment of 10s. additional for each entry (Poultry, Dairy Produce, Wool, Rural Industries, and Horse-shoeing at double fees) till 10 o'clock Wednesday morning (4th June), at the Society's Office, Edinburgh. Printed forms of Entry will be issued on application to the Secretary, No. 8 Eglinton Crescent, Edinburgh. Admission Orders for Exhibits and Attendants will be forwarded to Exhibitors, by post, previous to the Show.

Between 29th May and 26th June an Exhibitor who has made, in due time, an entry of Horses, Cattle, Sheep, Goats or Pigs, in a particular class, will be permitted to substitute for it an entry of another animal in the same class on payment of a fee of Five Shillings per entry.

Licences for moving Stock.

3. This Premium List is published and the Show will be held subject to any Orders that may be issued by the Ministry of Agriculture or Local Authorities. Any licences that may be required for the movement of Stock into or away from the Show must be obtained by Exhibitors. For these licences application should be made to the Chief Constable, Dumfries.

Diseased Animals.

4. Animals suffering from any form of infectious or contagious disease—including ringworm or other form of infectious or contagious skin ailment—must not be brought to the Show. Those infringing this Rule shall be liable to a fine of 40s., and to have their Stock removed.

Horses suffering from cold.

The Steward of Horses shall have power to require that any animal showing symptoms of cold be examined by the Veterinary Surgeon, and, if found to be so suffering, the animal shall be isolated or excluded from the Showyard.

Fees to accompany Entries.

5. No Entry can be received or recorded unless it is accompanied by the necessary fees, and complies fully with the Regulations in the Premium List, the Secretary being empowered to return entries sent without the necessary fees.

Particu- lars of Entries.

6. The Schedule of Entry must be filled up so far as within the knowledge of the Exhibitor. The Society shall have power at any time to call upon an Exhibitor to furnish proof of the correctness of any statement in his entry.

Name of Breeder.

7. The name of the Breeder, if known, must be given, and if the Breeder is not known, a declaration to that effect, signed by the Exhibitor, must be made on the Entry Schedule, and no pedigree will be entered in the Catalogue when the Breeder is unknown.

No Substi- tution of Animals.

8. All animals, except calves, foals, and lambs shown with their dams, must be entered in the classes applicable to them, and cannot be withdrawn after entry, or other animals be substituted in their place, except as provided in Rule 2 above.

One Class only.

9. For prizes given by the Society, no animal shall be allowed to compete in more than one class, or to compete in any class except that prescribed for animals of its pedigree and description; but this Rule does not apply to the Jumping and Harness Classes.

Ownership.

10. All stock exhibited at the Show, except where otherwise stated in the Premium List, must be, at the time of entry, the *bona fide* property of the Exhibitor in whose name it is entered.

11. Exhibitors are alone responsible for the accuracy and eligibility of their entries. The recording of an entry or the admission of the exhibit to the Showyard will not relieve the Exhibitor of this responsibility. The entry-fee paid for an animal entered in a class for which it is not eligible is not returnable. *Responsibility for Entries.*

12. In the event of the entries in any section of Cattle, Horses, Sheep, Goats, or Pigs being less in number than an average of three per class, or the number of different Exhibitors in the section being less than three, the classes for that section shall be cancelled automatically for the year and the entry fees returned. *Cancelling of Entries.*

13. The Society shall not be liable for any loss or damage which Stock, Poultry, Dairy Produce, &c., Implements, or other articles may sustain at the Show, or in transit. *Society not liable.*

14. The Society reserve to themselves the right of refusing, cancelling, or prohibiting the exhibition of entries from any person who, after 1st January 1904, has been expelled from the membership of any Agricultural or Dairy Society, or who may have been prohibited, suspended, or disqualified from making entries or exhibiting at the Show or Shows of any Agricultural or Dairy Society or Breed Society in consequence of having attempted to obtain a Prize by giving a false Certificate, or by other unfair means, or who is under exclusion from any Breed Society for fraudulent practices. *Disqualified Exhibitors.*

15. When an animal has previously been disqualified by the decision of any Agricultural or Breed Society in the United Kingdom, such disqualification shall attach, if the Exhibitor, being aware of the disqualification, fail to state it, and the grounds thereof, in his entry, to enable the Directors to judge of its validity. *Animal Disqualified.*

16. Any artificial contrivance or device of any description found on or proved to have been used on an animal, either for preventing the flow of milk or for any other improper purpose, will disqualify that animal from being awarded a Premium, and the Owner of said animal may be prohibited from again entering Stock for any of the Society's General Shows, for such a period as the Directors may see fit. *Tampering with Animals.*

17. Horses shall not be blindfolded while being shown in the Ring.

18. The Society further reserve to themselves the right of refusing any entries they may think fit to exclude, or to cancel any entry made, or to prohibit the exhibition of any entry. *Blindfolding Horses. Rejecting Entries.*

19. Stock entered for competition, and actually in the Show, is subject to the control and under the orders of the Stewards, Secretary, and other Show officials of the Society, and such stock may not be withdrawn from competition without the consent of the Stewards or Secretary. *Control of Exhibits.*

20. Persons making insulting remarks to, or in any way unduly interfering with, the Judges, Stewards, or other officials while in the performance of their duties, and all Exhibitors or others in charge of stock while in the judging rings refusing to accept or display tickets, rosettes, &c., awarded by the Judges, and handed to them by the Stewards or other officials, or tearing up tickets, rosettes, &c., so awarded and handed to them, or indulging in any similar conduct, shall be considered guilty of misconduct, and shall be dealt with under these rules. *Improper Conduct.*

21. All persons in charge of stock or other exhibits, and all persons admitted into the Showyard, shall be subject to the rules of the Society, and shall obey the orders of the Stewards, Secretary, and other officials of the Society. Exhibitors shall be answerable for the conduct of their servants or representatives. *Subject to Orders.*

The Stewards and other officials have power to enforce the regulations of the Society in their different departments. *Power of Officials.*

22. A protest having reference to exhibits at the Show may be lodged by any person having interest. Protests having reference to competitions which take place on the first day of the Show must be lodged *Protests.*

in writing with the Secretary at his Office in the Showyard not later than 9 A.M. on Wednesday, the second day of the Show, and parties must be in attendance at the Secretary's Office in the Showyard at 9.30 A.M. that day, when protests may be disposed of. Protests relating to competitions taking place after the first day of the Show must be lodged before 5 P.M. on the day on which the particular exhibition takes place. Each protest must state specifically the grounds of objection, and must be accompanied by a deposit of £2, 2s., which deposit may, if the objection be proved frivolous to the satisfaction of the Directors, be forfeited. Protests may be lodged at any time by Directors, and in this case no deposit will be required. Protests will be heard and determined by the Directors. Protests on veterinary grounds not received.

*Penalties
for
Offences.*

23. The violation of any one of the regulations, or disobedience of the orders of the Directors, Stewards, Secretary, or other officials of the Society, shall render the offending person liable to the forfeiture of all premiums awarded to him, or of such a portion as the Directors may ordain, and also liable to be expelled from the membership of the Society, and disqualified from again, or for a certain number of years, exhibiting at the Shows of the Society, or to have his case disposed of by fine or otherwise as the Directors may determine.

*Final
Authority.*

24. The decision of the Directors shall, in every matter arising at or in connection with the Show, be final; and every person present at the Show, whether as a Judge, Exhibitor, Visitor, or otherwise, shall be deemed thereby to have agreed to refer the subject-matter of such decision to the final determination of the Directors to the exclusion of all Courts of Law.

*Intimating
Decisions.*

25. All decisions under these rules may, along with the names and addresses of the persons against whom such decisions have been pronounced, be communicated by the Secretary of this Society to the Secretaries of all Agricultural or Dairy Societies holding open Shows in the United Kingdom, and to the Secretaries of all Breed Societies in the United Kingdom, and may be published in the Annual Reports of this Society, and in such newspapers or journals as the Directors may determine; and every Exhibitor competing at the Show, and every person present at the Show, whether as a Director, Member of Committee, Steward, Judge, Exhibitor, Visitor, or otherwise, shall be deemed thereby to have consented to such communication and publication.

*Former
Winners.*

26. An animal to which a first Premium has been awarded, even if it should not qualify for that Premium, or an animal which subsequently becomes entitled to a first Premium, at a General Show of the Society, cannot again compete in the same class, notwithstanding any alteration in the heights stated for such class, but may be exhibited as Extra Stock.

*Herd-
books.*

27. Shorthorn, Aberdeen-Angus, Galloway, Belted Galloway, Highland, British Friesian, and Red Poll cattle must be entered in the herd-books—Ayrshire Cattle in the herd-book or any Appendices thereto—or the Exhibitor must produce evidence that his animal is eligible to be entered therein.

*Height of
Horses.*

28. All Horses or Ponies entered in classes in which a particular height is stated shall, before being judged, be measured with their shoes on. No subsequent measuring or alteration of shoes will be permitted.

*Weight of
Shoes.*

29. Exhibitors of Hackney and Harness Horses shall be required to adhere to the Rules and Regulations of the Hackney Horse Society with regard to the weight of shoes on their exhibits, the Society's Veterinary Inspector being instructed to examine all the Hackneys and Harness Horses on the opening morning of the Show (this year on the Wednesday morning), and see that the following Rules as to the weight of shoes are attended to—viz., (a) For Hackneys exceeding 14 hands (except Hackney yearling colts and Hackney yearling fillies), no shoe (nails included) may exceed 2 lb. in weight; (b) for Ponies not exceeding 14 hands, Hackney

yearling colts and Hackney yearling fillies, no shoe (nails included) may exceed 1½ lb. in weight.

30. Breeding Stock must not be shown in an improper state of fatness, *Overfeeding.* and the Judges are requested not to award Premiums to overfed animals; and no Cattle or Sheep which after the age of twelve months have been exhibited as Fat Stock at any Show are eligible to compete in the Breeding Classes for the Society's Prizes.

31. Aged Bulls and Stallions must have had produce, and, along with *Sires.* two-year-old Bulls, three-year-old Colts, and two-shear and aged Tups, have served within the twelve months immediately preceding the Show.

32. Except as may be otherwise specially provided in this Premium List, *Calving Cows.* cows of all breeds (other than Ayrshire, British Friesian, and Red Poll) must have had a calf within nine months previous to the Show, and when exhibited must be in milk. Cows of the Ayrshire, British Friesian, and Red Poll breeds must have had a calf within fifteen months previous to the Show. *Animals of any age that have had a calf must be shown as Cows.*

33. Two-year-old Heifers of the Shorthorn, Aberdeen-Angus, Galloway, Belted Galloway, British Friesian, and Red Poll breeds, two-year-old Yeld Ayrshire Heifers, and three-year-old Highland Heifers, must be in calf when exhibited, and the Premiums will be withheld till birth be certified, which must be within nine months after the Show. *In-calf Heifers.*

34. A Mare entered in a class for "Mares with foal at foot" must have *Mares.* produced a foal after 1st January of the year of the Show, must have regularly nursed her own or another foal, and must have the foal with her in the Show. If the mare's own foal is alive it must be the foal shown with the mare. In the case of a Mare that has not foaled before the Show, or whose foal has died, she shall, if not in milk, be eligible without further entry to compete among the Yeld Mares if a corresponding class for Yeld Mares be included in the Premium List. Draught Yeld Mares must produce a foal within twelve months from the first day of the Show. A Mare in a class for "Mares or Geldings" may or may not have had a foal in the year of the Show, but shall not have her foal exhibited with her, nor be in milk at the time of the Show.

35. All Sows born in or before 1928 must have produced a litter of pigs *Sows.* in the year of the Show before the opening day. Sows born between 1st January and 1st September 1929 must either have produced a litter of pigs before the Show, or produce a litter within three months of the last day of the Show. Certificates of the date of farrowing must be supplied in every case.

36. With reference to Regulation 33, birth of a live or full-time calf must be certified; and in regard to Regulation 34, birth of at least a nine months' foal; or in the case of the death of the dam, a Veterinary Surgeon's certificate must be produced certifying that at the time of death the animal was so far advanced with calf or foal that if it had lived it would have produced a calf or foal within the periods stated in Rules 33 and 34. Certificates required by the foregoing Regulations will be issued after the Show, and must reach the office of the Secretary as follows: calving certificates within ten months, farrowing certificates within four months, and foaling certificates within thirteen months, of the last day of the Show. In default of this, the animal will be regarded as having failed to fulfil the Regulations, and the prize will therefore pass to the animal next in order of merit or be forfeited. *Calves and Foals. Calving, Farrowing and Foaling Certificates.*

37. Except when otherwise provided, the awards of Special Prizes shall not be subject to the Regulations as to calving and foaling. *Special Prizes.*

38. The Premiums awarded, except those withheld till birth of calf or foal or litter of pigs is certified, will be paid as soon after the Show as practicable, and, with the exception of the Tweeddale Gold Medal, Special Cups, and Medals, may be taken either in money or in plate. *Payment of Prizes*

*Veterinary
Examina-
tion of
Stallions
and Colts*

39. No Stallion or entire Colt, two years old or upwards, shall be allowed to compete for any of the Society's Prizes unless it has previously been licensed for stud purposes during the current year by the Department of Agriculture for Scotland, the Ministry of Agriculture and Fisheries, or the Irish Department of Agriculture.

*Soundness
of other
Horses.*

40. Judges are particularly requested to satisfy themselves, as far as possible, regarding the soundness of all Horses before awarding the Prizes, and to avoid giving Prizes to animals showing symptoms of hereditary disease. The Judges may consult the Society's Veterinary Surgeon if they deem it expedient. Private accommodation is provided for the examination of horses by the Veterinary Surgeon. No protests on veterinary grounds will be received.

*Accommo-
dation for
examina-
tion.**Kees.*

41. Every Ewe must have given birth to and reared a lamb in the year of the Show; and Ewes of the Blackface and Cheviot breeds must be in milk, and have their lambs at foot.

Milking.

42. Animals in milk of the Dairy breeds must be milked dry at 6 o'clock on the evening previous to the opening of the Show in the presence of, and to the satisfaction of, the Steward of Cattle or a representative of the Society duly authorised by him. Animals arriving after six o'clock will be milked dry at the time of arrival.

All animals in milk, in the Ayrshire Cattle Classes, must be milked out in the ring before the awards are made.

Clipping.

43. Sheep must have been clipt bare after the first day of the November preceding the Show, no part of the animal to be clipt prior to that date—this Rule not to apply to Cheviot Sheep.

No Blackface Sheep shall be eligible which has not been clipt bare on or after the 1st April of the year of the Show.

*Colouring-
etc., of
Sheep and
Pigs.*

44. The Steward of Sheep, who can call in assistance if so desired by him, shall have full power to disqualify any pen of Blackface, Cheviot, Border Leicester, and Half-bred Sheep which he considers unnaturally coloured, or when the fleece, face, or legs have been dealt with by the use of foreign substances.

The use of artificial whitening or powder on Large White and Middle White Pigs is prohibited, and the Judge is empowered to disqualify any pig so whitened or powdered.

*Flock
Books.*

45. All Oxford Down and Suffolk Sheep shown must be entered or eligible for entry in the Oxford Down and Suffolk Flock Books respectively.

Poultry.

46. In Poultry the Aged Birds must have been hatched previous to, and Cockerels and Pullets in, the year of the Show.

*Railway
Passes.*

47. Railway Certificates for Stock, for both outward and return journeys, are issued to Exhibitors before the Show along with their Tickets of Admission (see page 86).

*Admission
of Stock.*

48. Poultry and Stock will be admitted on Monday, the day before the opening of the Show, and, with the exception of Horses, must be in the Yard before 12 o'clock that night. Horses must be in before 8 o'clock on the morning of Tuesday, except those entered in classes for which other times for arrival are elsewhere stated in this List. Judging begins at 9.30 A.M. on Tuesday. Poultry and Stock will be exhibited on Tuesday, Wednesday, Thursday, and Friday. Any animals selected by the Stewards may be required to take part in the Stock Judging Competition on the Thursday. Stock may be admitted on the Saturday preceding the Show, but only by sending two days' prior notice to the Secretary's Office in the Showyard.

Parades.

49. Horses and Cattle must be paraded at the times stated in the Programme of the Show, and when required by the Stewards, and under their direction. Females of the Highland Cattle breed born in or after 1927 must be paraded; those born before 1927 will be paraded at the option of the exhibitor. In Parade, Horses must be ridden or led as provided in their respective classes. Prize and commended Cattle and Horses will receive two rosettes each, which must be attached to the head of the

animal, one on each side. Attendants must be beside their animals *forty-five minutes before the hour of Parade*, and be ready to proceed to the ring immediately on receiving the order of the Stewards. Infringement of this Rule, or failure of any attendant to obey the orders of the Society's officials, will render the Exhibitor liable to a fine of 20s. for each separate infringement or act of disobedience, and to the forfeiture of any or all of the Prizes awarded to him at this Show.

50. Exhibitors shall be answerable for all acts, whether committed by themselves, their servants, or others in charge of their Stock, and shall be responsible for the condition of their animals during the whole time they remain in the Showyard. *Responsibility of Exhibitors.*

51. No animal shall be taken out of its stall after 10 A.M. during the Show except by order of the Stewards, or with permission of the Secretary. *Moving from stalls.*

52. Cattle shall not be taken out of their stalls to be washed after the Judging has commenced. Cattle must not be washed beside the Judging Rings. Those infringing this Rule shall be liable to a fine of 10s. *Washing Cattle.*

53. Soap, resin, or other adhesive material must not be used in dressing cattle or horses. The use of blacking or other colouring matter on cattle is prohibited. Infringement of this Rule will render the animal upon which the material is used liable to be disqualified. *Soaping prohibited. Colouring matter.*

54. Loose-boxes will be provided for all horses; covered accommodation for other live stock. Stalls for nurse cows charged at ordinary rates. Boxes (floored) for attendants on Cattle, Horses, Sheep, Goats, and Pigs will be provided at a charge of 40s. for each box for members; 50s. for non-members. (See Rule 79.) *Loose-boxes and Stalls.*

55. Exhibitors requiring the boxes, stalls, or pens for their animals to be floored must give instructions, stating the Catalogue No., to the Society's Showyard Erector, Mr John Reid, Showyard, ten days before the Show opens. (For charges, see Rule 78.) *Floored Boxes and Stalls for Animals.*

56. Bulls must be secured by nose-rings, with chains or ropes attached, or with strong halters and double ropes. All Cattle, other than Highland Cattle, must be tied in their stalls. *Securing Cattle.*

57. During the time the Show is open to the public no rug shall be hung up so as to conceal any animal in a horse-box or stall, except with the special permission of the Steward of that department. *Concealing Animals.*

58. Five days' supply of straw, hay, grass, and tares will be provided free by the Society. Any additional fodder or other kinds of food required will be supplied at fixed prices in the Forage-yard. The Forage-yard will close at 1.30 P.M. on Friday, the last supply to be given to attendants then; and if any extra supply is required on account of stock remaining in the Yard after the close of the Show, notice must be given to the Forage Steward not later than 5 o'clock on Thursday. Any servant removing bedding from an adjoining stall will be fined in double the amount taken. Exhibitors may fetch their own cake or corn to the Yard, but not grass, tares, hay, or straw. Coops, food, and attendance for Poultry and Rabbits will be provided by the Society. *Fodder.*

59. Servants in charge of Stock must bring their own buckets or pails and a piece of rope or sheep-net to carry their forage. Mangers, and sheep and pig troughs, will be provided. *Feeding appliances.*

60. Sawdust must not be used as bedding for Stock. *Sawdust.*

61. As the command of water in the Yard is limited, it is particularly requested that waste be avoided. *Water.*

62. No lights allowed in the Yard at night, and Smoking is strictly prohibited within the Sheds. Those infringing this Rule shall be liable to a fine of 10s. The gates will be closed at midnight, and no person shall be allowed to enter or leave the Yard between that time and 5 A.M. without a special permit. *Lights and Smoking. Closing of Gates.*

63. Stock or Poultry cannot be removed from the Yard till 5 P.M. on Friday, the last day of the Show, except on certificate by the Veterinary *Removal of Stock.*

Surgeon employed by the Directors, countersigned by the Steward of the department or the Secretary.

Withdrawal of horses over-night.

64. At the close of the Show on Tuesday, Wednesday, and Thursday, horses may be withdrawn for the night on a deposit of £5 for each animal, which shall be forfeited, along with any prize money it may have gained, if the animal is not brought back. They must return between 7 and 7.30 the following morning, and those not in before 8 shall forfeit 10s. Horse passes to be applied for at the Secretary's Office between 5 and 6 p.m. on Tuesday, and the deposit, unless forfeited in whole or in part, will be returned between 12.30 and 2.30 on Friday.

Order in removal.

65. When the Stock is leaving the Yard, no animal is to be moved till ordered by those in charge of clearing the Yard. Those transgressing this Rule shall be liable to a fine of 10s., and to be detained till all the other Stock is removed.

Penning and removing Poultry.

66. Poultry may be penned before the opening and removed at the close of the Show by Exhibitors themselves or their representatives. In the event of neither the Exhibitor nor an authorised representative of the Exhibitor being present to pen or remove Poultry, the birds will be penned and removed by men hired and paid by the Society, but this will be done on the understanding that the men are hired to do the work on behalf of Exhibitors, and solely at their risk, and that the Society will be in no way responsible for expenses incurred or loss of or injury to Exhibits by errors or accidents in penning, despatching, or conveying Exhibits.

Closing of Poultry Shed to Public.

67. On the opening day of the Show the Poultry Shed will be closed to the public during the Judging. On the last day of the Show the Poultry Shed will be closed to the public at 4 p.m.; at 5 p.m. Exhibitors or their representatives will be admitted to the Shed to remove Exhibits, provided the Exhibitor has, *not later than 11 A.M. on the last day of the Show*, given written notice to the Secretary to the effect that the Exhibitor or the Exhibitor's representative will attend at the Poultry Shed at 5 p.m. to remove the birds.

JUDGING STOCK AND POULTRY.

Opening Gates.

68. On Tuesday, the first day of the Show, no person will be admitted, except Servants in charge of Stock, till 8 a.m., when the Gates are opened to the public.

Judging.

69. The Judges will commence their inspection at 9.30 a.m. The spaces reserved for the Judging will be enclosed, and no encroachment shall be permitted.

Insufficient merit.

70. In no case shall a Premium be awarded unless the Judges deem the animals to have sufficient merit; and where only one or two lots are presented in a class, and the Judges consider them unworthy of the Premiums offered, it shall be in their power to award a lower prize.

Commendations.

71. In addition to the Premiums, the Judges may award **one** Very Highly Commended, **one** Highly Commended, and as many Commended tickets in each class as they consider justified by the number and merit of the entries.

Ayrshire, British Friesian, and Red Poll Cows and Heifers.

72. Ayrshire, British Friesian, and Red Poll Cows which have not calved before the Show, whether entered in a class for Cows in Milk or for Cows in Calf, shall be judged along with the Cows in Calf, and Ayrshire, British Friesian, and Red Poll Cows or Heifers which have calved before the Show—in whichever of the classes entered—shall be judged along with Cows in Milk.

Attending Members duties.

73. Attending Members will accompany the Judge of each section. It will be the duty of Attending Members to bring the animals out to the Judges and to see that no obstruction is offered to them, and that the space reserved for the is not encroached upon; to ticket the prize

animals; to send the Nos. of the prize animals to the Award Lectern near the Secretary's Office; to assist the Judges in completing their return of awards; and should any difficulty arise, to communicate with the Stewards or Secretary.

74. It shall not be competent for any Exhibitor, nor for his Factor or Land-Steward, to act as a Judge or attending Member in any class in which he is competing.

DAIRY PRODUCE.

75. Dairy Produce will be received in the Showyard on Monday, the day before the opening of the Show, and till 8 A.M. on Tuesday, the first day of the Show. Judged at 9.30 A.M. on Tuesday. Exhibited Tuesday, Wednesday, Thursday, and Friday.

76. Dairy Produce must have been made on the Exhibitor's farm in the year of the Show. No Exhibitor shall show more than **one** lot in each class. Exhibits of Dairy Produce may be placed before the opening and removed at the close of the Show by Exhibitors themselves or their representatives. In the event of neither the Exhibitor nor a person with written authority from the Exhibitor being present to place or remove exhibits, they will be placed and removed by men hired and paid by the Society, but this will be done on the understanding that the men are hired to do the work on behalf of Exhibitors, and solely at their risk, and that the Society will be in no way responsible for expenses incurred or loss of or injury to exhibits by errors or accidents in placing, despatching, or conveying exhibits. In the case of exhibits which are not removed by 5.30 P.M. on the closing day of the Show, the Society will hold itself at liberty to hand them over to the railway companies for despatch to the respective Exhibitors.

*Placing
and re-
moving
Dairy
Produce.*

STALL RENT (INCLUDING ENTRY FEE).

77. The Stall Rents (which include Entry Fees) as stated opposite the individual Classes in this List, shall be paid by Exhibitors when making their Entries. The Secretary is instructed to return entries sent without the necessary fees.

Stall Rent.

FLOORED BOXES AND STALLS.

78. Exhibitors desiring the boxes, stalls, or pens for their animals to be floored can have this done by giving instructions, stating the Catalogue No., ten days before the opening of the Show, to the Society's Showyard Erector (Mr John Reid, Showyard, Dumfries), to whom the following charges for flooring have to be paid: Horses, 30s. each; Ponies, Cattle, Sheep, and Pigs, 20s. each.

*Floored
Stalls for
Animals.*

ACCOMMODATION FOR ATTENDANTS.

79. Boxes for accommodation of attendants on Stock will, if desired, be provided beside the Stock at a charge of 40s. per box for members and 50s. for non-members. Attendants' boxes will be floored and lined with wood, with door. Applications for attendants' boxes must accompany entries of Stock, and (in the case of Cattle, Horses, and Pigs) Exhibitors must state the animal next to which the attendant's box is to be placed. Attendants' boxes cannot be guaranteed after the closing date.

*Accommo-
dation for
Attendants.*

IMPLEMENTS AND OTHER ARTICLES.

- Admission of Goods.* 80. Implements will be received in the Yard from Tuesday, 15th July, till 5 o'clock on the afternoon of Monday, 21st July. Exhibited Tuesday, Wednesday, Thursday, and Friday. The Schedule of Entry must be filled up so far as within the knowledge of the Exhibitor, and prices must be stated.
- Premiums.* 81. No Money Prizes or Medals, except when specially offered, will be given by the Society for Implements of any kind.
- Refusing Entries.* 82. Agricultural Implements, and Implements and collections of articles not Agricultural, will be received for Exhibition, but the Secretary is entitled to refuse Entries from dealers in articles not deemed worthy of Exhibition.
- Local Operatives.* 83. In order to encourage exhibits of Agricultural Implements from operative Blacksmiths and Carpenters in the district of the Show, open space will be provided for these in some less prominent part of the Yard at a charge of 15s. for space 10 feet wide and 20 feet deep.
- Articles not entered.* 84. Every article to be exhibited must be entered on the Society's Entry Form. Any article not so entered that is taken to the Show is liable to be ordered out of, or removed from, the Showyard, or confiscated to the Society. Exhibitors infringing this rule are moreover liable to a fine of £1.
- Selling by auction and noisy behaviour forbidden.* 85. "Cheap-Jacks" are not admitted to the Showyard. The selling of goods by auction, shouting, and other behaviour calculated to annoy visitors or Exhibitors, are strictly forbidden. Exhibitors infringing this Regulation are liable to a fine of £1, and to have themselves and their goods ordered out of, or removed from, the Showyard, or to have their goods confiscated to the Society.
- Placing Exhibits.* 86. The articles of each Exhibitor must all be placed in one stand, except Implements in motion, and must not on any account extend beyond the allotted space. No article shall be moved out of its stand, or the stand dismantled, till the termination of the Show, at 5 P.M. on Friday. Those infringing this Rule shall be liable to a fine of 10s.
- Removing Exhibits.* 87. When the ground requires to be broken, the turf must be carefully lifted and laid aside, and the surface must be restored to the satisfaction of the Society, and at the expense of the Exhibitor. Failing this being done, the Society shall be at liberty to restore the ground and charge the cost to the Exhibitor.
- Restoring Turf.* 88. Exhibitors must arrange their own articles *within* the space allotted to them before 9 o'clock on Tuesday, the first day of the Show, and to the satisfaction of the Stewards in charge of the Implement Yard. Exhibitors are prohibited from sub-letting space allotted to them, and from displaying the name of any other firm on their Stand.
- Signs.* All signs, except signs on gables, must face the front only. Nails must not be driven into the canvas.
- Handbills.* 89. Exhibitors are not allowed to distribute handbills anywhere in the Yard except at their own Stand; and they must not for this or any other purpose encroach upon the adjacent alleys or open spaces.
- Sweeping Stands, &c.* 90. Exhibitors are required to have their Stands and the portions of the alleys immediately adjoining them swept up before eight o'clock on each morning of the Show.
- Fuel.* 91. All Machines requiring steam or fire must be entered as such in the Certificate, and will be placed in the Motion Yard. *Coke only shall be used in all cases where fire is required.* Coal shall not be used at any time in the Showyard. Those infringing this Rule shall incur a penalty of £5.
- Steam Engines.* 92. No Steam Engine shall be driven in the Yard at a greater speed than 4 miles an hour. Traction Engines shall not be used in conveying Exhibits or other goods from one place to another in the Showyard.

93. Locomotive and Traction Engines and other Machines must not be moved from their places without permission of the Secretary or Stewards, and must not leave their stands till 6 P.M. on Friday. *Traction Engines.*

94. There must be attached to each Implement, when forwarded to the Show, a label bearing the Exhibitor's name, and that of the Implement, as well as the number of the Exhibitor's stand. *Consigning Imple-ments.*

95. The carriage of all Implements must be prepaid.

96. Photographing in the Showyard is not permitted, except by photographers having a Stand in the Showyard or holding a "Photographer's Ticket." The "Photographer's Ticket" may be had from the Secretary, price 20s. It admits the holder to the Show when open to the public, and entitles him to photograph in the Showyard, subject to arrangements made by the Stewards. It does not entitle the holder to sell photographs in the Showyard. No photographer shall be allowed in the ring during Parades, except with the sanction of the Steward of Parades. *Photo-graphing in Show-yard.*

97. Covered Booths for Offices (9 feet by 9 feet), purely for business, not for exhibition of goods, can be had for £5 to Members and £7 to Non-Members. *Offices.*

98. Each Exhibitor in the Implement Department who is not a Member of the Society will receive one free Ticket of Admission to the Showyard for himself or a member of his firm, and will receive, in addition, for the use of attendants employed by him at his Stand, two Tickets of Admission for each complete ten feet of shedding in the Motion Yard, and one Ticket for each complete ten feet of shedding in the other sections. No additional Free Tickets can be issued in any circumstances whatever. Additional Attendants' Tickets, not more than three for each ten feet of frontage, and in no case exceeding a maximum of twenty for one Exhibitor, may be obtained by application in writing by the Exhibitor at 6s. each. *Exhibitors and Atten-dants' Tickets.* *No tickets will be issued without an Order.*

99. The Tickets of Admission for Exhibitors and Attendants referred to in the foregoing Regulation will (about fourteen days prior to the Show) be issued to the Exhibitors in blank, with the number of the Exhibitor's Stand. The name of the person for whom each ticket is intended must be written on it before it is used. Each person holding a Free Ticket of Admission must sign his or her name on the back thereof, and must also, when required, sign his or her name in the book at the Entrance Gate. Exhibitors' attendants are strictly cautioned not to lend or transfer their Tickets, which can be used only by the persons whose names they bear, and who must be *bona fide* acting for, or employed by, the Exhibitor. No Ticket is transferable. An Exhibitor is liable to a fine of £1 for each case of transfer or other improper use of a Ticket issued to himself or employee. *Tickets to be filled up and signed.*

100. The following are the arrangements for the admission of Supplies (Refreshments or other goods) for Stand-holders during the Show: Messenger on foot (with or without hand-barrow) with supplies, admitted by Special Ticket; price for one admission, 2s., for the four days, 6s. Motor or horse vehicle and driver, with supplies, admitted by Special Ticket; price for one admission, 2s., for the four days, 10s. These Special Tickets may be had from the Secretary. Vehicles, with supplies, admitted throughout the day on the first day of the Show; on the other three days they will not be admitted between the hours of 10 A.M. and 5 P.M. except by written permit from the Secretary. *Tickets not Trans-ferable. Improper use of Tickets. Admission of Supplies for Stand-holders.*

101. The riding of Cycles in the Showyard is prohibited. *Cycles.*

102. The Society will not be responsible for any accident that may occur from the machinery belonging to any Exhibitor; and it is a condition of entry that each Exhibitor shall hold the Society harmless, and indemnify it against any legal proceedings arising from any accident caused by his machinery. *Accidents.*

103. The giving of Alcoholic Drinks to visitors at Stands in the Show is strictly prohibited. With a view to the enforcement of this rule *Alcoholic Drinks.*

the Society reserves the right of unrestricted access, by its authorised representatives, to all Exhibitors' Stands during the Show.

Gas. 104. Exhibitors desiring the use of gas in the Showyard should apply to the Manager, Gas Works, Dumfries, not later than Saturday, 14th June.

Space for Stands. 105. * Ground to be taken in spaces of 10 feet frontage by 20 feet deep, and in Motion Yard in spaces of 10 feet frontage by 50 feet deep. Exhibitors must take their space in one or other of the following Sections. Space is not let partly covered and partly open. Exhibits not in motion may be excluded from the Motion Yard. The space in the Motion Yard being limited in extent, and intended mainly for exhibits in motion, not more than one-fifth of the space allotted to any one Exhibitor—and in no case more than 600 square feet—may be occupied in the Motion Yard by exhibits not in motion.

Maximum Space. 106. The maximum extent of space which any one Exhibitor may apply for shall be 60 feet of frontage in the Motion Yard, and 120 feet of frontage in the other Sections.

Allocation of space. 107. The Society reserves the right to allot to applicants for Stands either the whole or part of the space they ask for.

Fitting up of Stands. 108. Exhibitors requiring work executed in connection with the fitting up of stands allotted to them must employ the Society's Showyard Erector—Mr John Reid, 55 Blenheim Place, Aberdeen. The execution of orders received later than one week before the opening of the Show cannot be guaranteed.

109. Rates for space, payable by Exhibitors when making their Entries :—

	Members.	Non-Members.
1. Open ground without Shedding, 20 ft. deep, per 10 ft.	£1 10 0	£2 5 0
2. Special open ground, without Shedding, 20 ft. deep, per 10 ft.	2 10 0	3 5 0
3. Ordinary Shedding, 20 ft. deep, 7 ft. to eave, per 10 ft.	1 10 0	2 5 0
4. Special Shedding, 20 ft. deep, 7 ft. to eave, per 10 ft.	2 10 0	3 5 0
5. Ordinary Shedding, 20 ft. deep, 7 ft. to eave, <i>close boarded at back</i> , per 10 ft.	3 0 0	4 0 0
6. Special Shedding, 20 ft. deep, 7 ft. to eave, <i>close boarded at back</i> , per 10 ft.	4 10 0	5 10 0
7. † Motion Yard, without Shedding, 50 ft. deep, per 10 ft.	3 0 0	4 15 0
8. † Motion Yard, with Shedding (10 ft. open behind, 20 ft. covered, and 20 ft. <i>open in front</i>), 11 ft. to eave, per 10 ft.	4 10 0	6 0 0
9. Special Section for Motor Vehicles, 30 ft. deep (20 ft. covered and 10 ft. <i>open in front</i>), 15 ft. to eave, per 10 ft.	4 10 0	5 10 0
10. Covered Booths for offices, 9 ft. by 9 ft., each	5 0 0	7 0 0
11. Press offices, 9 ft. by 9 ft., each	£4.	

† See Rules 105 and 106.

Tents and marquees not allowed in the Showyard. All internal fittings to be executed by the Exhibitor at his own expense. The Society's Showyard Erector must be employed. See Rule 108.

NEW IMPLEMENTS.

1. An Exhibitor who desires to enter a "New Implement" for competition for the Society's Silver Medal must enter it separately as a "New Implement" at the commencement of the specification of his proposed exhibits; and he must define clearly, on a special form obtainable from the Secretary, the exact nature of the novelty which qualifies such implement to be entered for a Medal. Unless the "New Im-

* Special provision may be made for Exhibitors of both machinery in motion and implements and machinery not in motion on application being made to the Secretary.

plement" be properly described in the specification, and particulars of its novelty are given at the time of making the entry, it will not be accepted.

2. For each entry of a "New Implement," sent with an application for space, made in accordance with Regulation 109, a non-returnable Entry Fee of £1 will be charged. Late entries of "New Implements" only will, however, be considered up to 9th June, provided that no increase of space beyond that originally allotted to the Exhibitor will be occasioned by such New Implements being shown at his stand.

3. In cases of sufficient merit, the Judges will recommend the award of the Society's Silver Medal to New Implements for agricultural or estate purposes, or to new improvements in such implements. Before making an award the Judges shall report to the Directors whether they consider a practical trial necessary.

4. The Society does not bind itself to try in the field every "New Implement" entered for a Silver Medal. Any Exhibitor who expresses a wish to do so can, with the sanction of the Steward of Implements, at his own expense take his New Implement out of the Showyard during the Show week and put it to work, and if within a reasonable distance, the Judges will, if they deem it necessary, inspect it at work and decide if it is worthy of a Silver Medal.

5. No Silver Medals will be awarded to, nor can any entry as New Implements be accepted of, machines of any class for which competitive trials have been announced by the Society as about to take place.

6. The Judges of New Implements will commence their inspection at 2.30 P.M. on Monday, 21st July, and will take in rotation the stands of the Exhibitors who have entered New Implements for the Society's Silver Medals. Each Exhibitor, or his representative, will be expected to be at the stand to explain the working of the Implement to the Judges. If the exhibit be not ready and in working order by the time the Judges make their inspection, it is liable to be struck off the list.

7. All publications by Exhibitors of the award of the Society's Silver Medals must state the year of the award, and must specify the exact nature of the "New Implement," of the improvement, or of the attachment to an Implement, for which the Silver Medal has been awarded.

8. On the recommendation of the Judges, with the approval of the Directors, any New Implement of merit, which cannot be sufficiently tried, or which is capable of further development, may be entered and exhibited as a "New Implement" at the succeeding Show of the Society.

9. The Judges' decision, when duly accepted and recorded, will in all cases be final.

RESERVED SEATS (NUMBERED) IN GRAND STAND.

For Charges and Tickets, apply to Secretary up to opening day of Show. Thereafter tickets are sold only at the Booking-Office in Showyard behind Grand Stand.

ADMISSION OF THE PUBLIC.

The public will be admitted daily at 8 A.M. Judging begins on Tuesday at 9.30 A.M. The charges for admission to the Yard will be—**Tuesday**, from 8 A.M. till 5 P.M., 7s. 6d. **Wednesday**, from 8 A.M. till 5 P.M., 5s. **Thursday**, from 8 A.M. till 5 P.M., 2s. 6d.; from 5 P.M. till 8 P.M., 1s. **Friday**, from 8 A.M. till 5 P.M., 1s.

On **Thursday** and **Friday** children under twelve years of age admitted at 6d.

No Pass-out Checks given, and no re-admission without payment.

Season Tickets—12s. 6d. each—on application to Secretary. On the days of the Show, Season Tickets are sold only at the Entrance Gates.

ADMISSION OF MEMBERS AND EXHIBITORS.

On exhibiting their "*Member's Badge*," which is strictly not transferable, Members of the Society are admitted free to the Showyard. Badges will be sent to all Members residing in Great Britain, Northern Ireland, and Irish Free State, whose addresses are known, and on no account will duplicates be issued. **All Members not producing their badges must pay at the gates, and the admission money will not on any account be returned.** Badges must be signed by Members before being presented at the gate, and Members should continue to wear the badge during the whole time that they are in the Showyard.

Tickets of admission to the Showyard are sent to Exhibitors of Stock, Poultry, Dairy Produce, &c. (not Members), whose Entry Fees amount to not less than 12s. 6d.

For Exhibitors of Implements and their assistants tickets are issued as provided in the Regulations for Implements.

VARIOUS.

Exhibitors may display their own Placards *inside and in front of* their stands; with this exception, no Bills of any kind other than those of the Society are permitted on any of the Show erections. No newspapers or any other articles to be carried about the Yard for sale or display.

No Carriages or Equestrians admitted without special leave from the Directors, and then only for Invalids. Bath-chairs may be brought in.

Premium Lists, Regulations, and Certificates of Entry may be obtained by applying at the Secretary's Office, No. 8 Eglinton Crescent, Edinburgh.

All Communications should be addressed to The Secretary of the Highland and Agricultural Society of Scotland, No. 8 Eglinton Crescent, Edinburgh. From 15th to 24th July, to the Secretary's Office, Showyard, Dumfries.

Address for Telegrams—"SOCIETY," EDINBURGH.

Telephone No.—EDINBURGH, 23655.

RAILWAY ARRANGEMENTS.

The Railway Companies will be furnished with a list of the Exhibitors of Stock and Implements, after the 1st July. All applications for horse-boxes and trucks, and for information as to train arrangements, must be made by the Exhibitors themselves to the Stationmaster where their stock is to be trucked.

The arrangements made by the Railway Companies for the conveyance of Live Stock and Goods to and from the Show are indicated below, but exhibitors are recommended to apply to the respective companies for full particulars:—

1. Live Stock and Goods to the Show to be charged ordinary rates.
2. Live Stock and Goods from the Show, if sold, to be charged ordinary rates.
3. Live Stock from the Show, if unsold, and returned not later than the second day after the closing day of the Show (excluding Sunday), to be carried at half rates back to the Station whence the animals were sent, at owner's risk, on surrender of a Certificate from the Exhibitor, provided in accordance with the Railway Companies' requirements, and signed by the Secretary, to the effect that they are really unsold; failing surrender of such certificate, ordinary rates will be charged. The reduction to half rates is to be allowed only when the Stock are returned by the same route as that by which they were conveyed to the Show, but it shall be in the option of the Railway Company or Companies to return the Stock at half rates by a different route.
4. Live Poultry from the Show, *if unsold*, to be carried by Passenger Train at half rates back to the Station from which sent, at O.R., on surrender of an

agreed certificate signed by the Secretary of the Show to the effect that the Poultry are unsold and remain the property of the Exhibitor. No certificate will be required for such traffic which is intended by the owner to be returned from the Show to the original sending Station by the same route as originally forwarded and the charges prepaid for both the outward and return journeys.

Poultry are only charged at the half rate when returned not later than the second day after the closing of the Show (Sunday being treated as a *dies non*).

5. Horse-boxes, or other Passenger Train vehicle, will not be provided for the carriage of Live Stock sent by Goods Train and invoiced at Goods Train rates. *For rates for Horse-boxes by Passenger and Special Trains, apply to the Railway Companies.*

6. Provender conveyed to and from Agricultural Shows with Live Stock will be charged at the applicable rates, subject to a free weight allowance, viz.—

Cattle	per animal, 56 lb.
Horses	56 "
Sheep, goats, lambs, pigs, and calves	28 "

7. The carriage of all Live Stock, Implements, and other articles going to the Show for exhibition must be PREPAID; and the carriage on all traffic returned from the Show by Passenger Train Service must be PREPAID.

The carriage charges on Live Stock conveyed in special vehicles by Passenger Train and intended to be returned to the original sending Station may also be prepaid for the return journey at the original sending Station if the owner so desires.

The Railway Charge on all exhibits which are conveyed by Passenger Train in the Guard's Van and intended to be returned from the Show direct to the original sending Station by the same route must be PREPAID, for both the outward and return journeys, at the original sending Station. The agreed form of address label for Poultry, Rabbits, Dairy Produce, Bee Appliances, Wool, and Rural Industries exhibits, which will be supplied through the Secretary of the Society, must be used in such cases.

8. Attendants in charge of Live Stock are conveyed free in the cases shown below, when certified by the owners to be *bona fide* in charge of such Live Stock:—

In Horse-Boxes.—Horses and Cattle: One man for each consignment, except where the consignment requires more than one vehicle, when one man to each vehicle may be sent free; but where two or three Horses or Cattle forming one consignment are sent in the same Horse-box and a man is required to travel with each animal, a man for each animal may be conveyed free, provided each animal is charged for separately.

In Horse-Boxes.—Small animals: One man to each vehicle.

In specially constructed Cattle Trucks.—Cattle or other animals: One man to each vehicle.

9. Agricultural Machines, Implements, and other Exhibits from the Show, if unsold, to be conveyed at half rates back to the Station whence they were sent, at Owner's risk, on production of a Certificate from the Exhibitor, provided and signed by the Show Secretary, to the effect that they are unsold; failing production of such Certificate, ordinary rates must be charged. The reduction to half rates is to be allowed only when the articles are returned by the same route as that by which they were conveyed to the Show, but it shall be in the option of the Railway Company or Companies to return the articles at half rates by a different route.

10. Unsold articles, previously carried by railway, transferred from one Show to another, or exhibited at several Shows consecutively, and returned to the Station from whence originally sent, will be conveyed at half rates at Owner's risk, on production of a Certificate from the Exhibitor (provided and signed by the Show Secretary) to the effect that they are unsold; failing production of such Certificate, ordinary rates will be charged. This applies only to Goods Trains.

11. The ordinary rates charged for carriage do not in any case include delivery to, or collection from, the Showground.

12. Agricultural Societies' Show Plant must be charged at Class 10 rates, station to station.

13. Tents, Canvas, and other articles, not for exhibition, to be charged the ordinary rates both going and returning.

14. Carriages and other Road Vehicles are only conveyed by Passenger Train when this can be conveniently done.

DELIVERY AND COLLECTION CHARGES.

Cartage Charges to be paid by the Exhibitor for the Delivery or Collection of traffic between the Railway Station at Dumfries and the Showground of the Highland and Agricultural Society's Show at Dumfries on 22nd, 23rd, 24th, and 25th July 1930.

General traffic	5s. 6d. per ton.
Minimum charge per consignment	3s.
Implements and Machinery (Agricultural), not exceeding 1 ton each	5s. 6d. per ton.
Minimum charge per delivery	3s.
Implements and Machinery (Agricultural) on their own wheels (specially hauled), not exceeding 1 ton	7s. 6d. each.
When hauled on their own wheels behind lorry, loaded or partly loaded with goods, actual weight at	6s. per ton.
Single articles, exceeding 1 ton but not exceeding 3 tons	8s. per ton.
Single articles, exceeding 3 tons but not exceeding 5 tons	9s. 6d. per ton.
Single articles, exceeding 5 tons, by special arrangement only, but no less charge than	11s. 9d. per ton.
Loaded vans on their own wheels exceeding 1 ton but not exceeding 3 tons	8s. per ton.
Loaded vans on their own wheels exceeding 3 tons but not exceeding 5 tons	9s. 6d. per ton.
Loaded vans on their own wheels exceeding 5 tons, by special arrangement only, but no less charge than	11s. 9d. per ton.
Rustic Houses, by special arrangement only, but no less charge than	14s. per load.
Carriages, on their own wheels	6s. each.
Carriages, if carried on Company's lorries	7s. 6d. per ton.
Minimum charge	7s. 6d.
Cattle, in floats	6s. per head.
Minimum charge for each float	8s. 6d.
Sheep, Goats, and Pigs, in floats	1s. 6d. per head.
Minimum charge for each float	8s. 6d.
Pigs, in crates	3s. 3d. per crate.
Minimum charge per load	6s. 6d.
Ordinary Parcels by passenger train	6d. each.
Miscellaneous passenger train traffic, in- cluding packages of plants and flowers carried at O.R. rates S. to S.	1s. per cwt.
Minimum charge per consignment	1s. 6d.
*Poultry in crates or hampers	} 9d. per crate or hamper.
*Rabbits in crates, hampers, &c.	
Cartage from point to point inside the Show Ground	3s. per hour.
Minimum charge	3s.

* Poultry and Rabbit exhibits only will be conveyed at the Society's expense from the Railway Station to the Showyard and back, but no exhibit subject to railway charges will be received by the Society. All other delivery charges must be paid by the Exhibitor.

THE PRESIDENT'S CHAMPION MEDALS

A Champion Medal is given by the Duke of Buccleuch and Queensberry, K.T., President of the Society, for the *best Animal* in each of the following sections:—

- | | | |
|--|---|--|
| 1. Shorthorn.
2. Aberdeen-Angus.
3. Galloway.
4. Belted Galloway.
5. Highland.
6. Ayrshire.
7. British-Friesian.
8. Red Poll.
9. Clydesdale Stallion or Colt.
10. Clydesdale Gelding. | 11. Clydesdale Mare or Filly.
12. Shire.
13. Suffolk.
14. Hunter.
15. Highland or Western Island Pony.
16. Shetland Pony.
17. Harness Horse.
18. Blackface Sheep.
19. Cheviot.
20. Border Leicester. | 21. Half-bred.
22. Oxford-Down.
23. Suffolk.
24. Shropshire.
25. Dorset Horn.
26. Leicester.
27. Wensleydale Longwool.
28. Goat.
29. Large White Pig.
30. Middle White.
31. Large Black. |
|--|---|--|

NOTE.—Animals entered as *Extra Stock* may compete for these Medals. Former Winners of the President's Medals are eligible. The Society shall have the right to photograph the Winners for publication in the 'Transactions.' At this Show no animal can be awarded more than one of these Medals.

ENTRY FEE		CLASS	<div style="text-align: center;"> * CATTLE SHORTHORN Judge: S. Campbell <i>President's Medal for best Shorthorn</i> </div>				PREMIUMS			
Members	Non-Members						First	Second	Third	Fourth
							£	£	£	£
			¹ The Duthie Perpetual Challenge Cup, value £150, for best Animal in the Shorthorn Classes, "Extra Stock" being eligible to compete.							
25/-	45/-	1	Bull born before 1st December 1927				15	10	5	3
25/-	45/-	2	Bull born on or after 1st December 1927 and before 1st April 1928				15	10	5	3
25/-	45/-	3	Bull born on or after 1st April 1928, and before 1st December 1928				12	8	4	2
25/-	45/-	4	Bull born on or after 1st December 1928 and before 1st April 1929				12	8	4	2
25/-	45/-	5	Bull born on or after 1st April 1929				10	6	4	2
			² The Emilio R. Casares, jun., "Junior Champion Cup," value £50, for best Shorthorn Bull in Class 5, calved on or after 1st April of the year preceding the Show, that has passed the tuberculin test.							
			³ Best Shorthorn Bull in the Show, entered or eligible for entry in Coates's Herd-Book—£20.							
			³ Silver Medal to the Breeder of the winner of above Prize.							
			Breeder of best Bull of any age in the five Classes—The Silver Medal.							

* See Rules 82 and 83.

¹ This Cup was gifted by the late Mr William Duthie, Collynie. The Cup may not be won on more than one occasion with the same animal. The animal winning the Cup must be certified free from hereditary disease. The winner of the Cup shall, before delivery thereof is made to him, give security to the Society that he shall surrender the same to the Society and deliver it at the Society's office when called upon to do so. The winner of the Cup on each occasion will receive a miniature replica as a memento of his winning the Cup.

² Given by Mr Emilio R. Casares, jun. This Cup will become the property of the Exhibitor who shall win it three times, not necessarily in succession.

³ Given by the Shorthorn Society.

ENTRY FEES			CLASS	CATTLE	PREMIUMS			
Members	Non-Members	First			Second	Third	Fourth	
£	£	£			£	£	£	
SHORTHORN—continued								
25/-	45/-	6	Cow born before 1st December 1926, in Milk	12	8	4	2	
25/-	45/-	7	Cow born on or after 1st December 1926, and before 1st December 1927	10	5	3	2	
25/-	45/-	8	Cow or Heifer born on or after 1st December 1927, and before 1st December 1928	10	5	3	2	
25/-	45/-	9	Heifer born on or after 1st December 1928, and before 1st April 1929	10	5	3	2	
25/-	45/-	10	Heifer born on or after 1st April 1929	10	5	3	2	
¹ Best Shorthorn Female in the Show, entered or eligible for entry in Coates's Herd-Book—£20.								
¹ Silver Medal to the Breeder of the winner of above Prize.								
PRIZE MONEY BY SOCIETY.				£246				
CONTRIBUTED PRIZES				40				

¹ Given by the Shorthorn Society.² Given by Mr W. Gilchrist Macheth of Dunira, Comrie. A Silver Medal will be given by the Society to the winner as a memento of his winning the Cup.

ENTRY FEES		CLASS	CATTLE	PREMIUMS			
Members	Non-Members			First	Second	Third	Fourth
				£	£	£	£
			ABERDEEN-ANGUS—continued				
			¹ Ballindalloch Challenge Cup, value £50, for the best Bull of any age in the four Classes.				
			² Silver Cup, value 50 guineas, for best Aberdeen-Angus Bull not exceeding three years of age, to become the property of an Exhibitor who shall win it three times, not necessarily in succession.				
			Breeder of best Bull of any age in the above Classes—The Silver Medal.				
			Exhibitor of the Winner of the Ballindalloch Challenge Cup—The Silver Medal.				
			Breeder (if not also the Exhibitor) of the Winner of the Ballindalloch Challenge Cup—The Silver Medal.				
25/-	45/-	15	Cow in Milk born before 1st December 1926	12	8	4	2
25/-	45/-	16	Cow in Milk born on or after 1st December 1926, and before 1st December 1927	12	8	4	2
25/-	45/-	17	Cow or Heifer born on or after 1st December 1927, and before 1st December 1928	10	5	3	2
25/-	45/-	18	Heifer born on or after 1st December 1928 and before 1st March 1929	10	5	3	2
25/-	45/-	19	Heifer born on or after 1st March 1929	10	5	3	2
			¹ Ballindalloch Challenge Cup, value £50, for the best Cow of any age in Classes 15, 16, and 17.				
			Exhibitor of the Winner of the Ballindalloch Challenge Cup—The Silver Medal.				
			Breeder (if not also the Exhibitor) of the Winner of the Ballindalloch Challenge Cup—The Silver Medal.				
			³ Silver Cup, value £50, for the best female animal of the Aberdeen-Angus breed, to become the property of an Exhibitor who shall win it four times, not necessarily in succession. "Extra Stock" eligible to compete.				
			⁴ Champion Gold Medal for best Animal in the Breeding Classes, breeding animals shown as "Extra Stock" eligible to compete.				
			PRIZE MONEY BY SOCIETY . £226				

¹ "The Ballindalloch Challenge Cups," value £50 each, are offered for the best Bull of any age and best Cow of any age (Heifers excluded) in the Aberdeen-Angus Classes, the former presented by the late Sir George Macpherson Grant, Bart., and the latter by the late Sir John Macpherson Grant, Bart. Each Cup will become the property of the Exhibitor who shall win it five times, not necessarily in succession. The Exhibitor and Breeder of the successful animals each year will receive the Society's Silver Medal, with suitable inscription.

² Given by Senor Eduardo Estanguet, Argentina.

³ Presented by Mr Falconer L. Wallace of Candacraig and Balcairn, Strathdon. A Silver Medal will be given by the Society to the winner as a memento of his winning the Cup.

⁴ Given by the Aberdeen-Angus Cattle Society.

ENTRY FEES		CLASS	CATTLE	PREMIUMS			
Members	Non-Members			First	Second	Third	Fourth
			GALLOWAY				
			Judge: William M'Conchie				
			<i>President's Medal for best Galloway</i>				
			¹ Paisley Perpetual Gold Challenge Cup, value £300, for best Galloway animal, "Extra Stock" being eligible to compete.				
			² Dr Gillespie Memorial Challenge Trophy, value £50, for best Galloway Animal in the Breeding Classes, breeding animals shown as "Extra Stock" being eligible to compete—see conditions below.				
25/-	45/-	20	Bull born before 1st December 1927.	15	10	5	3
25/-	45/-	21	Bull born on or after 1st December 1927 and before 1st December 1928	15	10	5	3
25/-	45/-	22	Bull born on or after 1st December 1928	12	8	4	2
			Breeder of best Bull of any age in the three Classes—The Silver Medal.				
25/-	45/-	23	Cow in Milk, born before 1st December 1926	12	8	4	2
25/-	45/-	24	Cow in Milk, born on or after 1st December 1926 and before 1st December 1927	12	8	4	2
25/-	45/-	25	Cow or Heifer born on or after 1st December 1927 and before 1st December 1928	10	5	3	2
25/-	45/-	26	Heifer born on or after 1st December 1928	10	5	3	2
			PRIZE MONEY BY SOCIETY	£184			

¹ This Cup, along with an endowment of £600, was provided from money collected in Paisley by the late Provost Muir M'Kean, and is in commemoration of the Society's first Show at Paisley in 1913. This year the Cup is offered for the best Galloway animal. The animal winning the Cup must be certified free from hereditary disease. The winner of the Cup shall, before delivery thereof is made to him, give security to the Society that he shall surrender the same to the Society and deliver it at the Society's office when called upon to do so. The winner of the Cup on each occasion will receive a miniature replica in silver as a memento of his winning the Cup.

² This trophy was presented by the Galloway Cattle Society of Great Britain and Ireland for the best Galloway animal registered in the Galloway Cattle Society's Herd-Book, entered in any of the breeding classes, at the Show at which it may be competed for. The winner of the Trophy shall, before delivery thereof is made to him, give security to the Society that he shall surrender the same to the Society and deliver it at the Society's office when called upon to do so. The winner on each occasion will receive the Galloway Cattle Society's Silver Medal as a memento of his winning the Trophy.

ENTRY FEES		CLASS	CATTLE	PREMIUMS			
Members	Non-Members			First	Second	Third	Fourth
				£	£	£	£
			BELTED GALLOWAY				
			Judge: J. W. Alexander				
			<i>President's Medal for best Belted Galloway Animal</i>				
			¹ Knockbren Challenge Cup, value £50, for the best Belted Galloway Animal, "Extra Stock" being eligible to compete.				
25/-	45/-	27	Bull born before 1st December 1928	10	5	3	2
25/-	45/-	28	Bull born on or after 1st December 1928	10	5	3	2
25/-	45/-	29	Cow or Heifer born before 1st December 1927, in Milk or in Calf; if in calf and not in milk, to calve on or before 1st December of the year of the Show	10	5	3	2
25/-	45/-	30	Heifer born on or after 1st December 1927 and before 1st December 1928	10	5	3	2
25/-	45/-	31	Heifer born on or after 1st December 1928	10	5	3	2
			PRIZE MONEY BY SOCIETY £100				
			HIGHLAND				
			Judge: Peter M'Intyre				
			<i>President's Medal for best Highland Animal</i>				
25/-	45/-	32	Bull born before 1928	15	10	5	3
25/-	45/-	33	Bull born in 1928	15	10	5	3
25/-	45/-	34	Bull born in 1929	12	8	4	2
			² Perpetual Victory Challenge Cup, approximate value 50 Guineas, for the best Animal in the Male Classes, "Extra Stock" being eligible to compete.				
			Breeder of best Bull of any age in the three Classes—The Silver Medal.				
25/-	45/-	35	Cow of any age in Milk	12	8	4	2
25/-	45/-	36	Cow or Heifer born in 1927	10	5	3	2
25/-	45/-	37	Heifer born in 1928	10	5	3	2
25/-	45/-	38	Heifer born in 1929	10	5	3	2
			² Perpetual Victory Challenge Cup, approximate value 35 Guineas, for the best Animal in the Female Classes, "Extra Stock" being eligible to compete.				
			PRIZE MONEY BY SOCIETY £178				

¹ This Cup was presented by Mrs Brown, Kirkbren, Glasgow, for the best Belted Galloway animal registered in the Dun and Belted Galloway Cattle Breeders' Association Herd-Book, entered in any of the breeding classes, at the Show at which it may be competed for. The winner of the Trophy shall, before delivery thereof is made to him, give security to the Society that he shall surrender the same to the Society and deliver it at the Society's office when called upon to do so. The winner on each occasion will receive a Silver Medal as a memento of his winning the Trophy.

² Given by the Highland Cattle Society of Scotland.

ENTRY FEES		CLASS	PREMIUMS		
Members	Non-Members		First	Second	Third
			£	£	£
		CATTLE			
		AYRSHIRE			
		Judge: W. L. Ferguson			
		<p>1. To be eligible for competition in the Ayrshire Section Cows must have an authenticated Milk Yield, and younger Females (including Cows which have not completed their first lactation) and Bulls an authenticated Milking Pedigree, of a definite minimum amount.</p> <p>2. The minimum amount referred to shall be as follows, calculated on the basis of a period between calvings of 52 weeks, and 3·8 per cent of butter fat:—</p> <p>(a) Cows which have completed two or more lactations—700 gallons.</p> <p>(b) Cows which have completed only one lactation—600 gallons.</p> <p>(c) Younger Females and Bulls—an authenticated Milking Pedigree for dam and dam of sire on a similar basis.</p> <p>3. In the case of Cows with two or more lactations the record lodged may be that for any year the Exhibitor may select.</p> <p>4. In the case of a Cow which has no milking pedigree, and which has not completed her first lactation at date of entry, but is likely to calve again before date of Show, such Cow may be provisionally entered on her own milk yield produced within forty weeks after first calving, but when the Cow has calved again a further certificate in terms of the Rules must be obtained and produced before the Cow is allowed to enter the judging ring. The latter certificate is the standard of qualification, and failure to produce such will render the Cow liable to disqualification, and no entry money will be returned.</p> <p>5. The evidence of Milk Yield and Milking Pedigree shall be in the form of a Certificate signed by the Secretary of the Scottish Milk Records Association. The Certificate, besides giving the actual yields, shall give these calculated on a uniform basis of a period of 52 weeks between calvings, and 3·8 per cent butter fat. This latter figure shall be communicated to the Judges before adjudicating.</p> <p>In the case of Exhibitors founding on the Milk Yield of any animal, or animals, made in England, said Exhibitors must forward their Record Books, together with a Certificate from a competent analyst, stating that a butter fat test had been made at least once every 28 days during the period of lactation, and with details of said butter fat tests attached, to the Secretary of the Scottish Milk Records Association, who has undertaken to check the records and to certify same.</p> <p>6. The authenticated Milk Yields and authenticated Milking Pedigrees shall appear in the Catalogue.</p> <p><i>N.B.—Certificates above referred to must be obtained from Mr John Howie, 55 Alloway Street, Ayr, and lodged with Entries.</i></p> <p><i>President's Medal for best Ayrshire</i></p> <p>¹ Fife and Kinross Perpetual Gold Challenge Cup, value £200, for best Ayrshire Animal, "Extra Stock" being eligible to compete.</p>			

¹ This Cup, along with an endowment of £400, was subscribed for by the Counties of Fife and Kinross in commemoration of the Society's first Show at Cupar-Fife in 1912. This year the Cup is offered for the best Ayrshire Animal. The animal winning the Cup must be certified free from hereditary disease. The winner of the Cup shall, before delivery thereof is made to him, give security to the Society that he shall surrender the same to the Society and deliver it at the Society's office when called upon to do so. The winner of the Cup on each occasion will receive a miniature replica in silver as a memento of his winning the Cup.

ENTRY FEES		CLASS	CATTLE	PREMIUMS		
Members	Non-Members			First	Second	Third
				£	£	£
			CATTLE			
			AYRSHIRE—continued			
			¹ Cowhill Champion Cup, approximate value £30, for best Animal of the Ayrshire breed, entered with a number in the Herd-Book. The Cup to be won three times, not necessarily in succession, by the same person with different animals, before becoming the property of the winner.			
35/-	55/-	39	² Cow in Milk,* born before 1927	12	8	4
35/-	55/-	40	² Cow in Milk,* born on or after 1st January 1927	10	7	3
35/-	55/-	41	² Cow of any age in Calf,* and due to calve before 1st December of the year of the Show	10	7	3
			³ Special Prizes for Cows from Grade "A" (Tuberculin Tested) or Certified Herds, drawn from (Classes 39, 40, and 41. (<i>For Regulations, see footnote</i>))	7	5	2
25/-	45/-	42	Heifer born on or after 1st June 1927, in Calf and due to calve before 1st December of the year of the Show	10	7	3
25/-	45/-	43	Heifer born in 1928	10	5	3
25/-	45/-	44	Heifer born in 1929	8	5	3
			⁴ Special Prize of £10 for the best Female Animal of the Ayrshire breed entered with a number in the Ayrshire Cattle Herd-Book prior to 1st June 1930.			
25/-	45/-	45	Bull born before 1928	12	8	4
25/-	45/-	46	Bull born in 1928	10	7	3
25/-	45/-	47	Bull born in 1929	8	5	3
			Breeder of best Bull of any age in Classes 45, 46, and 47—The Silver Medal.			
			⁴ Special Prize of £10 for the best Male Animal of the Ayrshire breed entered with a number in the Ayrshire Cattle Herd-Book prior to 1st June 1930.			
			PRIZE MONEY BY SOCIETY	£178		
			CONTRIBUTED PRIZES	34		

¹ Presented by the late Major Henry Keswick, Cowhill Tower, Dumfries, to the Ayrshire Cattle Herd-Book Society, to be competed for annually at the Shows of the Highland and Agricultural Society of Scotland.

² Cows in these Classes must have produced a calf within fifteen months prior to the Show.

³ Given by Messrs Brown & Polson, Ltd., Paisley, and the Hon. T. G. P. Corbett, Rowallan.

Regulations regarding Special Prizes for Cows from Grade "A" (Tuberculin Tested) or Certified Herds.—Each entry must be accompanied by a Veterinary Certificate from a County Veterinary Officer, certifying that the animal is from a licensed herd. The animals will be housed separately at the beginning or end of their respective sections, one vacant stall being left between them and the other animals. Each animal to be entered in the Catalogue in its Class, a star to be placed against the Catalogue number with a relative note that the animal referred to is housed at the beginning or end of the section.

⁴ Given by the Ayrshire Cattle Herd-Book Society.

* See Rules 42 and 72.

ENTRY FEES		CLASS	PREMIUM		
Members	Non-Members		First	Second	Third
£	£		£	£	£
CATTLE					
BRITISH FRIESIAN					
Judge: Duncan A. MacLennan					
<i>President's Medal for best British Friesian Animal</i>					
¹ The MacRobert Champion Silver Bell, value 50 Guineas, for the best Animal in the British Friesian Classes, registered in or eligible for entry in the British Friesian Cattle Herd Book, "Extra Stock" being eligible to compete.					
35/-	55/-	48	² Cow in Milk,* born in or before 1926	12	8 4
35/-	55/-	49	² Cow in Calf,* and not in Milk, born in or before 1926	10	5 3
35/-	55/-	50	² Cow in Milk, born in 1927 or 1928	10	5 3
25/-	45/-	51	Heifer born in 1928	10	5 3
25/-	45/-	52	Heifer born in 1929, before 1st July	10	5 3
25/-	45/-	53	Heifer born in 1929, on or after 1st July	10	5 3
Champion Prize of £5 given by the British Friesian Cattle Society for the best Female exhibited.					
25/-	45/-	54	Bull born in or before 1927	12	8 4
25/-	45/-	55	Bull born in 1928	10	5 3
25/-	45/-	56	Bull born in 1929	10	5 3
Breeder of Best Bull of any age in Classes 54, 55, and 56—The Silver Medal.					
Champion Prize of £5 given by the British Friesian Cattle Society for the best Male exhibited.					
PRIZE MONEY BY SOCIETY				£162	
⁴ CONTRIBUTED PRIZES				40	

¹ Presented by Lady Rachel Workman MacRobert, Douneside, Tairland. This Bell will become the property of the Exhibitor who shall win it three times, not necessarily in succession. The winner of the Bell on each occasion will receive a miniature replica in silver as a memento of his winning the Bell. The Breeder of the winning animal will also receive a replica, provided he or she is not also the Exhibitor.

² Cows in these Classes must have produced a calf within fifteen months prior to the Show.

³ Contributed by the British Friesian Cattle Society.

* See Rule 72.

ENTRY FEES			CLASS	PREMIUMS		
Members	Non- Members	First		Second	Third	
				£	£	£
CATTLE						
RED POLL						
Judge : Major Norman Everett						
President's Medal for best Red Poll Animal						
¹ Kinmount Challenge Cup, value about £50, for the best Female Animal in the Red Poll Classes registered in the Red Poll Cattle Society's Herd- Book, "Extra Stock" being eligible to compete.						
25/-	45/-	57	² Cow in Milk or in Calf, born before 1928	10	5	3
25/-	45/-	58	Heifer born in 1928	10	5	3
25/-	45/-	59	Heifer born in 1929	10	5	3
25/-	45/-	60	Bull born in or before 1928	10	5	3
25/-	45/-	61	Bull born in 1929	10	5	3
PRIZE MONEY BY SOCIETY				£70		
³ CONTRIBUTED PRIZES				20		

PRIZE MONEY BY SOCIETY				£1344	0	
CONTRIBUTED				134	0	
CUPS, MEDALS, &c.				1284	5	
Total Prizes for Cattle				£2762	5	
[See Note as to EXTRA STOCK, p. 116.]						

¹ This Cup was presented to the Society by Lieut.-Colonel Charles Brook of Kinmount, Annan. The winner of the Cup shall, before delivery thereof is made to him, give security to the Society that he shall surrender the same to the Society and deliver it at the Society's office when called upon to do so.

² Cows in these Classes must have produced a calf within fifteen months prior to the Show.

^a Contributed by Red Poll Cattle Society.

ENTRY FEES		CLASS	PREMIUMS			
Members	Non- Members		First	Second	Third	Fourth
			£	£	£	£
* HORSES						
CLYDESDALE						
STALLION AND COLT						
Judge : Douglas D. Murray						
<i>President's Medal for best Clydesdale Stallion or Colt</i>						
1 Cawdor Challenge Cup, value 50 Guineas, for best Clydesdale Stallion or Colt.						
55/-	75/-	62	20	15	10	4
55/-	75/-	63	20	15	10	4
55/-	75/-	64	20	15	10	4
40/-	60/-	65	15	9	6	4
Breeder of best Male Animal of any age in the above Classes—The Silver Medal.						
PRIZE MONEY BY SOCIETY . . . £181						

* For prizes given by the Society, no animal is allowed to compete in more than one Class, except that horses entered in other Classes may also compete in the Jumping and Harness Classes.

¹ This Cup is offered by the Clydesdale Horse Society of Great Britain and Ireland (subject to the conditions of that Society) for the best Clydesdale Stallion or Colt registered in the Clydesdale Stud-Book, entered in any of the Clydesdale Horse Classes, at the Show at which it may be competed for. No Stallion rising five years old or upwards will be allowed to compete for this Cup unless proof be furnished to satisfy a Committee, appointed for this purpose by the Council of the Clydesdale Horse Society, that he has during the preceding season left at least 35 per cent of the mares served by him in foal. The Cup must be won four times by an Exhibitor with different animals (but not necessarily in consecutive years) before it becomes his absolute property. The animal winning this Cup must be certified free from hereditary disease. The winner of the Cup, other than the absolute winner, shall, before delivery thereof is made to him, give security to the Clydesdale Horse Society that he shall surrender the same to the Society and deliver it at the Society's office when called upon to do so. Until the Cup be won outright, the winner on each occasion will receive the Clydesdale Horse Society's Silver Medal as a memento of his winning the Cup.

Stallions and Colts, 2 years old and upwards, must be licensed for stud purposes. See Rule 39.

ENTRY FEES		CLASS	PREMIUMS										
Members	Non-Members		First £	Second £	Third £	Fourth £							
HORSES													
CLYDESDALE—continued													
GELDING													
Got by a Registered Clydesdale Stallion													
Judge: John Johnston													
President's Medal for best Clydesdale Gelding													
1 The Meiklem Gold Challenge Cup, value 110 guineas, for best Clydesdale Gelding, to become the property of an Exhibitor who shall win it four times with different animals, but not necessarily in succession. "Extra Stock" eligible to compete.													
40/-	60/-	66	Gelding	born before 1927	15	9	6	4	
40/-	60/-	67	Gelding	born in 1927	15	9	6	4	
40/-	60/-	68	Gelding	born in 1928	15	9	6	4	
40/-	60/-	69	Gelding	born in 1929	12	8	4	2	
PRIZE MONEY BY SOCIETY													£128

¹ Given by Mr William Meiklem, Bennoch Park, Kirkealdy.

ENTRY FEES		CLASS	PREMIUMS			
Members	Non-Members		First	Second	Third	Fourth
			£	£	£	£
HORSES						
CLYDESDALE—continued						
MARE AND FILLY						
Judge : James Fleming						
<i>President's Medal for best Clydesdale Mare or Filly</i>						
¹ Cawdor Challenge Cup, value 50 Guineas, for best Clydesdale Mare or Filly.						
55/-	75/-	70	Mare of any age, with Foal at foot	20	12	7 4
40/-	60/-	71	Yeld Mare born before 1927	15	9	6 4
40/-	60/-	72	Yeld Mare or Filly born in 1927	15	9	6 4
40/-	60/-	73	Filly born in 1928	15	9	6 4
40/-	60/-	74	Filly born in 1929	15	9	6 4
² William Taylor Memorial Prize of £10 and Certificate to the breeder of the best Clydesdale Filly entered in Classes 73 and 74.						
PRIZE MONEY BY SOCIETY			£179			
CONTRIBUTED PRIZE			10			
Total Prize Money for Clydesdale Horses, £498						

¹ This Cup is offered by the Clydesdale Horse Society of Great Britain and Ireland (subject to the conditions of that Society) for the best Clydesdale Mare or Filly registered in the Clydesdale Stud-Book, entered in any of the Clydesdale Horse Classes, at the Show at which it may be competed for. The Cup must be won four times by an Exhibitor with different animals (but not necessarily in consecutive years) before it becomes his absolute property. The animal winning this Cup must be certified free from hereditary disease. The winner of the Cup, other than the absolute winner, shall, before delivery thereof is made to him, give security to the Clydesdale Horse Society that he shall surrender the same to the Society and deliver it at the Society's office when called upon to do so. Until the Cup be won outright, the winner on each occasion will receive the Clydesdale Horse Society's Silver Medal as a memento of his winning the Cup.

² Given by William Taylor Memorial Committee.

Stallions and Colts, 2 years old and upwards, must be licensed for stud purposes. See Rule 29,

ENTRY FEES			CLASS	PREMIUMS			
Members	Non-Members	First		Second	Third	Fourth	
			£	£	£	£	
HORSES							
SHIRE							
Judge : James Gould							
(To be judged at 2.30 P.M. on Tuesday, 22nd July)							
President's Medal for best Shire Animal in Class 76							
40/-	60/-	75	Gelding, by a registered Shire Stallion, born before 1928				
			15	9	6	4	
40/-	60/-	76	Yeld Mare or Filly born before 1929				
			15	9	6	4	
[Note.—The Mares must be registered, or tendered for registration, in the Shire Horse Stud-Book before date of Show.]							
PRIZE MONEY BY SOCIETY			£40 16				
¹ CONTRIBUTED PRIZES			27 4				
SUFFOLK							
Judge : Sir Merrik R Barrell, Bart.							
(To be judged at 3 30 P.M. on Tuesday, 22nd July)							
President's Medal for best Suffolk Animal in Class 78							
40/-	60/-	77	Gelding, by a registered Suffolk Stallion, born before 1928				
			15	9	6	4	
40/-	60/-	78	Yeld Mare or Filly born before 1929				
			15	9	6	4	
[Note.—The Mares must be registered, or tendered for registration, in the Suffolk Horse Stud-Book before date of Show.]							
PRIZE MONEY BY SOCIETY			£40 16				
² CONTRIBUTED PRIZES			27 4				

¹ Given by the Shire Horse Society.² Given by the Suffolk Horse Society.

ENTRY FEES			CLASS	PREMIUMS		
Members	Non-Members	First		Second	Third	
£	£	£		£	£	£
HORSES						
HUNTER						
Judge: H. S. Brenchley						
(Classes 79 to 82 to be judged at 11 A.M. on Tuesday, 22nd July)						
President's Medal for best Hunter						
¹ Dumfries Centenary Silver Challenge Cup, value £100, for best Hunter. The Cup to become the property of an Exhibitor who shall win it three times, not necessarily in succession, at Shows at which there are not less than three Saddle Classes. "Extra Stock" not eligible to compete.						
55/-	75/-	79	Hunter Brood Mare, with Foal at foot	15	7	3
40/-	60/-	80	Yeld Mare, Filly, or Gelding born in 1927—in hand	10	5	3
40/-	60/-	81	Yeld Mare, Filly, or Gelding born in 1928—in hand	10	5	3
40/-	60/-	82	Filly, Colt, or Gelding born in 1929—in hand	10	5	3
² Best Hunter Filly, not exceeding three years old, registered with a number in the Hunter Stud-Book, or the entry tendered within a month of the award—Champion Gold Medal.						
(Classes 83 to 85 to be judged at 2.30 P.M. on Tuesday, 22nd July)						
40/-	60/-	83	Mare or Gelding, born before 1926, to carry 13 stone and over—in saddle	15	10	5
40/-	60/-	84	Mare or Gelding, born before 1926, to carry under 13 stone—in saddle	15	10	5
40/-	60/-	85	Mare or Gelding, born in 1926—in saddle	15	10	5
PRIZE MONEY BY SOCIETY				£169		

¹ Presented by Members of the Dumfriesshire Hunt to commemorate the centenary of the Highland Society's first Show at Dumfries in 1830.

² Given by the Hunters' Improvement and National Light Horse Breeding Society.

Stallions and Colts, 2 years old and upwards, must be licensed for stud purposes. See Rule 39.

ENTRY FEES		CLASS	PREMIUMS		
Members	Non-Members		First	Second	Third
			£	s	d
HORSES					
¹ HIGHLAND PONY and WESTERN ISLAND PONY					
Judge : Charles D. M. Ross					
<i>President's Medal for best Highland or Western Island Pony</i>					
<i>(To be judged at 1.30 P.M. on Tuesday, 22nd July)</i>					
² Special Prize of £10 given by National Pony Society for best Pony not exceeding 14.2 hands					
² Special Prize of £10 given by Highland Pony Society for best Pony not exceeding 14 hands.					
40/-	60/-	86	Stallion born before 1928, not exceeding 14.2 hands		
			8	4	2
40/-	60/-	87	Stallion born before 1928, not exceeding 14 hands		
			8	4	2
40/-	60/-	88	Mare born before 1928, not exceeding 14.2 hands, yield or with Foal at foot		
			8	4	2
40/-	60/-	89	Mare born before 1928, not exceeding 14 hands, yield or with Foal at foot		
			8	4	2
40/-	60/-	90	Entire Colt born on or after 1st January 1928		
			6	4	2
40/-	60/-	91	Filly born on or after 1st January 1928		
			6	4	2
PRIZE MONEY BY SOCIETY			£40		
CONTRIBUTED PRIZES			60		

¹ The Department of Agriculture for Scotland gives £40 towards prizes for Highland and Western Island Ponies.

² The animals winning these prizes must be entered or accepted for entry in the Highland Section of the National Pony Stud-Book, "Extra Stock" being eligible to compete. Competition to be strictly confined to animals passed sound and free from hereditary disease.

Stallions and Colts, 2 years old and upwards, must be licensed for stud purposes. See Rule 38.

ENTRY FEES		CLASS		PREMIUMS			
Members	Non-Members			First	Second	Third	Fourth
			HORSES				
			SHETLAND PONY				
			Judge : P. F. Manson				
			(To be judged at 1.30 P.M. on Tuesday, 22nd July)				
			(All to be shown in hand)				
			<i>President's Medal for best Shetland Pony</i>				
35/-	55/-	92	Stallion, not exceeding 10½ hands, born before 1927	8	5	3	2
35/-	55/-	93	Entire Colt, not exceeding 10½ hands, born in 1927 or 1928	8	5	3	2
35/-	55/-	94	Mare, not exceeding 10½ hands, with Foal at foot	8	5	3	2
35/-	55/-	95	Yield Mare, not exceeding 10½ hands	8	5	3	2
35/-	55/-	96	Filly, not exceeding 10½ hands, born in 1927 or 1928	8	5	3	2
			¹ Best Group of Shetland Ponies, drawn from the ordinary Classes, consisting of one male and two females	10	-	-	-
			² Silver Medal for the best Shetland Pony of the sex opposite to that of the winner of the President's Medal, entered or eligible for entry in the Shetland Pony Stud-Book.				
			PRIZE MONEY BY SOCIETY . . . £90				
			CONTRIBUTED PRIZES . . . 10				

¹ Given by "Four Lovers of the Breed," per Mr W. Mungall of Transy.² Given by the Shetland Pony Stud-Book Society.

Stallions and Colts, 2 years old and upwards, must be licensed for stud purposes. See Rule 39.

ENTRY FEES		CLASS		PREMIUMS			
Members	Non- Members			First	Second	Third	Fourth
				£	£	£	£
HORSES							
RIDING PONY							
(To be judged by the Hunter Judge at 4 P.M. on Wednesday, 23rd July)							
5/-	5/-	97	Mare or Gelding, any age, over 13.2 hands, and not exceeding 14.2 hands, in saddle	5	3	2	—
5/-	5/-	98	Mare or Gelding, any age, over 12.2 hands and not exceeding 13.2 hands, in saddle, to be ridden by boy or girl 10 years and under 14 years of age on first day of Show	5	3	2	—
5/-	5/-	99	Mare or Gelding, any age, not exceeding 12.2 hands, in saddle, to be ridden by boy or girl under 10 years of age on first day of Show	5	3	2	—
PRIZE MONEY BY SOCIETY				£30			
[Ponies in the above Classes must be in the Showyard not later than 3 P.M. on Wednesday, and may leave immedi- ately after the Afternoon Parade on Thursday. Boxes are not provided for these ponies.]							

ENTRY FEES		CLASS	PREMIUMS		
Members	Non- Members		First	Second	Third
			£	£	£
HORSES					
1 HORSE IN HARNESS					
Judge : Alexander Morton					
(To be judged at 11.15 A.M. on Wednesday, 23rd July)					
2 President's Medal for best animal in the Classes for Horses in Harness					
3 The "Glasgow" Champion Challenge Cup, value £50, for best Horse in Single Harness ; com- petition limited to First, Second, and Third Prize-Winners in Harness Classes, and animals entered as "Extra Stock."					
40/-	60/-	100	Yeld Mare, Filly, or Gelding, any age, in Harness, exceeding 15 hands, to be driven in the ring		
40/-	60/-	101	Yeld Mare, Filly, or Gelding, any age, in Harness, over 14 hands and not exceeding 15 hands, to be driven in the ring		
40/-	60/-	102	Yeld Mare, Filly, or Gelding, any age, not ex- ceeding 14 hands, to be driven in the ring		
PRIZE MONEY BY SOCIETY			£78		
[Horses in Harness Classes must be in the Showyard not later than Tuesday evening, judged on Wednesday, and may leave the Showyard on Thursday immediately after the Afternoon Parade.]					
PRIZE MONEY BY SOCIETY			£976 12		
CONTRIBUTED			134 8		
CUPS, MEDALS, &c.			380 10		
Total Prizes for Horses			£1491 10		
[See Note as to EXTRA STOCK, p. 116]					

¹ Animals entered in other Classes may be entered in the Harness Classes at an additional fee of 5s. if they are eligible.

² An animal that has won a President's Medal in another section in this Show shall not be eligible to compete for the Medal in this section.

³ The "Glasgow" Challenge Cup is offered for the best Horse in Single Harness, and will become the property of the Exhibitor who shall win it three times, not necessarily in succession. The winner of the Cup shall, before delivery thereof is made to him, give security to the Society that he shall surrender the same to the Society and deliver it at the Society's office when called upon to do so. The winner on each occasion will receive the Society's Silver Medal as a memento of his winning the Cup.

Shed accommodation for machines for Driving Competitions—Members, 10s.; Non-Members, 20s.

JUMPING COMPETITIONS

SPECIAL REGULATIONS

(See also the Regulations on pages 74 to 81)

1. Jumping Competitions will take place on the afternoons of Wednesday, Thursday, and Friday, 23rd, 24th, and 25th July, and on the evening of Thursday, 24th July.
2. Entries for each afternoon Competition will close at the Secretary's Office in the Showyard at 5 P.M. on the preceding day. Entries for Evening Jumping may be received until 5 P.M. on the evening of the Competition.
3. *Entry Fees*.—Wednesday and Thursday afternoons, £1; Friday, 10s. Evening Jumping, 10s.
4. *Accommodation* for jumping horses will be provided as follows: Covered shed in which to stand during the day free of charge; or, on application to the Secretary not less than ten days before the opening of the Show, loose-boxes will be provided at a charge (in addition to the Entry Fee) of £1, which must be paid along with the Entry Fee at the time of application.
5. Horses entered for jumping only need not enter the Showyard till 12 noon on the day of Competition, and may leave the Showyard at the close of the jumping.
6. *The Jumps* may consist of Single Hurdle, Gate, Double Hurdle, Wall, and Water Jump, power being reserved by the Society to alter these, as well as the Handicaps, as may be thought desirable.

ENTRY FEE	CLASS		First £	Second £	Third £	Fourth £
WEDNESDAY.						
<i>AFTERNOON.</i>						
20/-	1	Horse or Pony, any height	20	15	10	5
THURSDAY.						
<i>AFTERNOON.</i>						
20/-	2	Horse or Pony, any height, Handicap, hurdles and gate being raised 8 inches for the winner of the first prize, and 4 inches for the winner of the second prize in Class 1	20	15	10	5
<i>EVENING.</i>						
10/-	3	Horse or Pony, any height	10	8	5	3
FRIDAY.						
10/-	4	Horse or Pony, any height, Handicap, hurdles and gate being raised 8 inches for the winner of the first prize, and 4 inches for the winner of the second prize in either of Classes 1 or 2—4 inches extra for the winner of the two first prizes in Classes 1 and 2	15	10	5	3
		Champion Prize for most points in Prizes with one horse in Classes 1, 2, and 4—First Prize to count five points; Second Prize, four points; Third Prize, three points; Fourth Prize, two points; and Fifth Prize, one point—the money to be evenly divided in the event of a tie	10	—	—	—
Total Prize Money for Jumping, £179						

Special Entry Forms for above Competitions to be had on application.

ENTRY FEES			CLASS		PREMIUMS																																																																																									
Members	Non-Members	First £			Second £	Third £	Fourth £																																																																																							
<div>S H E E P</div> <div>*BLACKFACE</div> <div>Judges— Males, excluding Tup Lambs, William Sandilands Females and Tup Lambs, J. A. M'Donald President's Medal for best Blackface Sheep</div> <table><tr><td>15/-</td><td>25/-</td><td>103</td><td>Tup above two shear</td><td>12</td><td>8</td><td>4</td><td>2</td></tr><tr><td>15/-</td><td>25/-</td><td>104</td><td>Tup above one shear and not exceeding two shear</td><td>12</td><td>8</td><td>4</td><td>2</td></tr><tr><td>15/-</td><td>25/-</td><td>105</td><td>Shearling Tup</td><td>12</td><td>8</td><td>4</td><td>2</td></tr><tr><td>15/-</td><td>25/-</td><td>106</td><td>Tup Lamb</td><td>5</td><td>3</td><td>2</td><td>—</td></tr><tr><td>15/-</td><td>25/-</td><td>107</td><td>Ewe above one shear, with her Lamb at foot</td><td>10</td><td>5</td><td>3</td><td>2</td></tr><tr><td>15/-</td><td>25/-</td><td>108</td><td>Shearling Ewe or Gimmer</td><td>10</td><td>5</td><td>3</td><td>2</td></tr></table> <div>PRIZE MONEY BY SOCIETY £128</div> <div>CHEVIOT</div> <div>Judge: William I. Elliot President's Medal for best Cheviot Sheep 1 Renfrewshire Perpetual Gold Challenge Cup, value £250, for best Cheviot Sheep, "Extra Stock" being eligible to compete.</div> <table><tr><td>15/-</td><td>25/-</td><td>109</td><td>Tup above one shear</td><td>12</td><td>8</td><td>4</td><td>2</td></tr><tr><td>15/-</td><td>25/-</td><td>110</td><td>Shearling Tup</td><td>12</td><td>8</td><td>4</td><td>2</td></tr><tr><td>15/-</td><td>25/-</td><td>111</td><td>Tup Lamb</td><td>5</td><td>3</td><td>2</td><td>—</td></tr><tr><td>15/-</td><td>25/-</td><td>112</td><td>Ewe above one shear, with her Lamb at foot</td><td>10</td><td>5</td><td>3</td><td>2</td></tr><tr><td>15/-</td><td>25/-</td><td>113</td><td>Shearling Ewe or Gimmer</td><td>10</td><td>5</td><td>3</td><td>2</td></tr></table> <div>PRIZE MONEY BY SOCIETY £102</div>							15/-	25/-	103	Tup above two shear	12	8	4	2	15/-	25/-	104	Tup above one shear and not exceeding two shear	12	8	4	2	15/-	25/-	105	Shearling Tup	12	8	4	2	15/-	25/-	106	Tup Lamb	5	3	2	—	15/-	25/-	107	Ewe above one shear, with her Lamb at foot	10	5	3	2	15/-	25/-	108	Shearling Ewe or Gimmer	10	5	3	2	15/-	25/-	109	Tup above one shear	12	8	4	2	15/-	25/-	110	Shearling Tup	12	8	4	2	15/-	25/-	111	Tup Lamb	5	3	2	—	15/-	25/-	112	Ewe above one shear, with her Lamb at foot	10	5	3	2	15/-	25/-	113	Shearling Ewe or Gimmer	10	5	3	2
15/-	25/-	103	Tup above two shear	12	8	4	2																																																																																							
15/-	25/-	104	Tup above one shear and not exceeding two shear	12	8	4	2																																																																																							
15/-	25/-	105	Shearling Tup	12	8	4	2																																																																																							
15/-	25/-	106	Tup Lamb	5	3	2	—																																																																																							
15/-	25/-	107	Ewe above one shear, with her Lamb at foot	10	5	3	2																																																																																							
15/-	25/-	108	Shearling Ewe or Gimmer	10	5	3	2																																																																																							
15/-	25/-	109	Tup above one shear	12	8	4	2																																																																																							
15/-	25/-	110	Shearling Tup	12	8	4	2																																																																																							
15/-	25/-	111	Tup Lamb	5	3	2	—																																																																																							
15/-	25/-	112	Ewe above one shear, with her Lamb at foot	10	5	3	2																																																																																							
15/-	25/-	113	Shearling Ewe or Gimmer	10	5	3	2																																																																																							

* Formal Declarations must be made at time of entry that the conditions as regards clipping, &c., have been strictly adhered to.

¹ This Cup, along with an endowment of £500, was provided from money collected in Renfrewshire by the late Provost Muir M'Kean of Paisley, and is in commemoration of the Society's first Show in the county of Renfrew in 1913. This year the Cup is offered for the best Cheviot Sheep. The animal winning the Cup must be certified free from hereditary disease. The winner of the Cup shall, before delivery thereof is made to him, give security to the Society that he shall surrender the same to the Society and deliver it at the Society's office when called upon to do so. The winner of the Cup on each occasion will receive a miniature replica in silver as a memento of his winning the Cup.

ENTRY FEES		CLASS	SHEEP	PREMIUMS			
Members	Non-Members			First	Second	Third	Fourth
				£	£	£	£
BORDER LEICESTER							
Judge : Alexander Findlay							
<i>President's Medal for best Border Leicester Sheep</i>							
¹ Tweeddale Gold Medal for best Border Leicester Tup.							
15/-	25/-	114	Tup above one shear	12	8	4	2
15/-	25/-	115	Shearling Tup	12	8	4	2
15/-	25/-	116	Tup Lamb	8	5	3	—
² Gold Medal for best Male Animal in the Border Leicester Classes, registered or eligible for registration in the Border Leicester Flock-Book. Animals entered as "Extra Stock" not eligible.							
15/-	25/-	117	Ewe above one shear	10	5	3	2
15/-	25/-	118	Shearling Ewe or Gimmer	10	5	3	2
15/-	25/-	119	Ewe Lamb	5	3	2	—
² Gold Medal for best Female Animal in the Border Leicester Classes, registered or eligible for registration in the Border Leicester Flock-Book. Animals entered as "Extra Stock" not eligible.							
PRIZE MONEY BY SOCIETY				£118			
HALF-BRED							
Judge : John B. Sproat							
<i>President's Medal for best Half-Bred Sheep</i>							
15/-	25/-	120	Shearling Tup	10	7	3	—
15/-	25/-	121	Ewe above one shear	10	5	2	—
15/-	25/-	122	Shearling Ewe or Gimmer	10	5	2	—
15/-	25/-	123	Ewe Lamb	5	3	2	—
PRIZE MONEY BY SOCIETY				£64			

¹ Annual Free Income from Fund of £500.² Given by the Society of Border Leicester Sheep-Breeders.

ENTRY FEES		CLASS	PREMIUMS		
Members	Non-Members		First	Second	Third
			£	£	£
SHEEP					
OXFORD-DOWN					
Judge: W. R. Gantlett					
(All sheep to be entered or eligible for entry in the Flock-Book)					
President's Medal for best Oxford-Down Sheep					
¹ Scottish Oxford-Down Sheep-Breeders' Challenge Bowl, value £50, for the best Oxford-Down Animal bred in Scotland, to be won three times by the same owner, but with different sheep, before becoming his property.					
15/-	25/-	124	Shearling Tup	8	5 3
15/-	25/-	125	Shearling Ewe or Gimmer	8	5 3
15/-	25/-	126	Tup Lamb	8	5 3
15/-	25/-	127	Ewe Lamb	5	3 2
PRIZE MONEY BY SOCIETY			£37		
¹ CONTRIBUTED PRIZES			21		
SUFFOLK					
Judge: Major Norman Everett					
(All sheep to be entered or eligible for entry in the Flock-Book)					
President's Medal for best Suffolk Sheep					
15/-	25/-	128	Tup, one shear and over	8	5 3
15/-	25/-	129	Shearling Ewe or Gimmer	8	5 3
15/-	25/-	130	Tup Lamb	8	5 3
15/-	25/-	131	Ewe Lamb	5	3 2
PRIZE MONEY BY SOCIETY			£43		
² CONTRIBUTED PRIZES			15		

¹ Given by Oxford-Down Sheep-Breeders' Association.² Given by the Suffolk Sheep Society.

ENTRY FEES			PREMIUMS			
Members	Non-Members	CLASS				
			First	Second	Third	
			£	£	£	
SHEEP						
SHROPSHIRE						
Judge: Alfred Mansell						
President's Medal for best Shropshire Sheep						
15/-	25/-	132	Tup, any age	6	4	2
15/-	25/-	133	Ewe or Gimmer	5	3	2
PRIZE MONEY BY SOCIETY . . .				£22		
DORSET HORN						
Judge: T. H. Merson						
President's Medal for best Dorset Horn Sheep						
15/-	25/-	134	Tup, any age	6	4	2
15/-	25/-	135	Ewe or Gimmer	5	3	2
PRIZE MONEY BY SOCIETY . . .				£17		
¹ CONTRIBUTED PRIZES . . .				5		
LEICESTER						
Judge: Captain C. H. Simpson						
President's Champion Medal for best Leicester Sheep						
15/-	25/-	136	Shearling Tup	6	4	2
15/-	25/-	137	Shearling Ewe or Gimmer	5	3	2
PRIZE MONEY BY SOCIETY . . .				£12		
² CONTRIBUTED PRIZES . . .				10		

¹ Given by the Dorset Horn Sheep-Breeders Association.² Given by the Leicester Sheep-Breeders' Association.

ENTRY FEES		CLASS	SHEEP			PREMIUMS					
Members	Non-Members					First	Second	Third			
WENSLEYDALE LONGWOOL											
Judge: William Dickinson											
President's Champion Medal for best Wensleydale Longwool Sheep											
15/-	25/-	138	Shearling Tup	.	.	6	4	2			
15/-	25/-	139	Shearling Ewe or Gimmer.	.	,	5	3	2			
PRIZE MONEY BY SOCIETY						£12					
1 CONTRIBUTED PRIZES						10					
FAT SHEEP											
Judge: John B. Sproat											
15/-	25/-	140	Three Fat Lambs, any breed or cross, dropped in the year of the Show	.	.	5	3	2			
[Exhibitors of Fat Sheep are requested to state the breed of sire and dam when making their entries.]											
PRIZE MONEY BY SOCIETY						£10					
PRIZE MONEY BY SOCIETY									£565		
CONTRIBUTED						61					
CUPS, MEDALS, &c.						345					
Total Prizes for Sheep						£971					
[See Note as to EXTRA STOCK, p. 116.]											

ENTRY FEES		CLASS	PREMIUMS			
Members	Non- Members		First	Second	Third	
£	£		£	£	£	
<h1>GOATS</h1>						
Judge: Thomas W. Palmer						
<h2>REGULATIONS FOR GOAT CLASSES.</h2>						
<p>The animals will be milked dry at 8 o'clock on the evening previous to the opening of the Show, in the presence of, and to the satisfaction of, the Steward or a representative of the Society duly authorised by him.</p> <p>All exhibits must be registered either in the Herd Book, Foundation Book or Show Register of the British Goat Society, in the name of the Exhibitor (the registered number being quoted on the entry form), or, if previously entered or owned by some one other than the Exhibitor, a transfer of ownership must be registered with the British Goat Society.</p>						
<p><i>President's Medal for best animal in the Goat Classes</i></p> <p><i>(All animals must be registered)</i></p>						
<p>Challenge Cup, value 10 Guineas, offered by the British Goat Society for the best Male Goat over one year.</p> <p>¹ Challenge Cup, value 20 Guineas, for the best Female Goat in the Show.</p> <p>² Challenge Cup, value £10, for best Female Anglo-Nubian Goat over two years old, in Milk, entered in the Anglo-Nubian section of the Herd Book, "Extra Stock" being eligible to compete.</p>						
5/-	10/-	141	Male Goat , any variety, over two years	3	2	1
5/-	10/-	142	Male Goat , any variety, over one but not exceeding two years	3	2	1
5/-	10/-	143	Male Kid , any variety, not exceeding one year	3	2	1
5/-	10/-	144	Female Goat , Toggenburg, British Toggenburg, Saanen, British Saanen, or British Alpine, in Milk	3	2	1
5/-	10/-	145	Female Goat , any other variety, in Milk	3	2	1
5/-	10/-	146	Goatling , any variety, over one but not exceeding two years	3	2	1
5/-	10/-	147	Female Kid , any variety, not exceeding one year	3	2	1

The Competition for Goats is recognised by the British Goat Society, 10 Lloyds Avenue, London, E.C.3, which will give Challenge Certificates (qualifying for a Championship) for the best Male Goat over one year, for the best Female Goat over two years that has borne a kid, and for the best dual purpose Goat over two years that has borne a kid; a Bronze Medal for the best female exhibit in Classes 144, 145, 146, and 147; and a Bronze Medal for the best male exhibit in Classes 141, 142, and 143.

¹ Given by Lord Dewar, London—to be competed for annually.

² Given by Mrs S. Macdonald, Garrochty—to be competed for annually.

ENTRY FEES		CLASS	PREMIUMS		
Members	Non-Members		First	Second	Third
£	£		£	£	£
5/-	10/-	148	GOATS		
5/-	10/-	149			
<p align="center">REGULATIONS FOR MILKING COMPETITION (CLASSES 148 AND 149).</p> <p align="center"><i>Goats entered for this Competition must be entered in both the Quantity and Quality Classes.</i></p> <p>The animals will be milked at 5 P.M. on Tuesday, 22nd July, at an appointed place in the order arranged by the Steward, and the milk of the next twenty-four hours will be taken for the Quality and Quantity Milking Competitions. The hours of milking shall be 8 A.M. and 5 P.M. on Wednesday, 23rd July.</p> <p>All Goats must have kidded within twelve months of the first day of the Show.</p> <p>The prizes will be awarded according to the following scale of points:—</p> <p>For each pound of milk 1 point.</p> <p>For each complete 6 days the Goat has been in milk (omitting the first forty days), with a maximum of 5.4 points . . . $\frac{1}{10}$ of a point.</p> <p>For each $\frac{1}{4}$ lb. of fat in the milk 5 points.</p> <p>In cases where the milk contains less than 3 per cent of fat 1 point will be deducted.</p> <p>In the Quantity Milking Competition points will be awarded for quantity and lactation only.</p> <p>The period of lactation to be calculated from the date of kidding to the first day of the Show. No prize will be awarded to a Goat giving less than 5½ lbs. of milk per day.</p> <p>Fractions of lbs. of milk and percentages of fat to be worked out in decimals and added to the total points.</p> <p>A Certificate giving the last date of kidding, signed by the owner of the Goat exhibited, or his Agent, must in every case be brought to the Steward of Goats as soon as possible after the animal has arrived in the Showyard.</p> <p>The milk yielded by Goats in the Showyard shall be the property of the Society.</p> <p>Note.—No animal is allowed to compete in more than one Class, except that Goats entered in Classes 144 and 145 may also be entered in Classes 148 and 149.</p>					
<p>PRIZE MONEY BY SOCIETY £42 0</p> <p>DEPARTMENT OF AGRICULTURE FOR SCOTLAND 12 0</p> <p>CUPS 41 10</p> <p>Total Prizes for Goats £95 10</p>					
[See Note as to EXTRA STOCK, p. 116:]					

ENTRY FEES		CLASS	PREMIUMS		
Members	Non-Members		First	Second	Third
			£	£	£
* PIGS					
LARGE WHITE					
Judge : R. P. Haynes					
<i>(All Large White Pigs to be entered or eligible for entry in the Herd-Book of the National Pig-Breeders' Association)</i>					
<i>President's Medal for best Large White Pig</i>					
		¹ Gold Medal, value £5 (or cash), for best Large White Boar.			
15/-	25/-	150 Boar born before 1929	8	4	2
15/-	25/-	151 Boar born in 1929	8	4	2
15/-	25/-	152 Boar born in 1930	6	3	1
		¹ Gold Medal, value £5 (or cash), for best Large White Sow.			
15/-	25/-	153 Sow born before 1929	8	4	2
15/-	25/-	154 Sow born in 1929	8	4	2
15/-	25/-	155 Sow born in 1930	6	3	1
PRIZE MONEY BY SOCIETY . . .			£76		
MIDDLE WHITE					
Judge : R. P. Haynes					
<i>(All Middle White Pigs to be entered or eligible for entry in the Herd-Book of the National Pig-Breeders' Association)</i>					
<i>President's Medal for best Middle White Pig</i>					
		¹ Silver Gilt Medal, value £2, 10/- (or cash), for best Middle White Boar.			
15/-	25/-	156 Boar born before 1930	8	4	2
15/-	25/-	157 Boar born in 1930	6	3	1
		¹ Silver Gilt Medal, value £2, 10/- (or cash), for best Middle White Sow.			
15/-	25/-	158 Sow born before 1929	8	4	2
15/-	25/-	159 Sow born in 1929	8	4	2
15/-	25/-	160 Sow born in 1930	6	3	1
PRIZE MONEY BY SOCIETY . . .			£62		

¹ Given by the National Pig-Breeders' Association

* See Rule 85.

ENTRY FEES		CLASS	PREMIUMS		
Members	Non-Members		First	Second	Third
			£	£	£
PIGS					
LARGE BLACK					
Judge: Henry J. Kingwell					
<i>President's Medal for best Large Black Pig</i>					
¹ Silver Challenge Cup, value 12 Guineas, for best Large Black Boar or Sow owned by an Exhibitor resident in Scotland, and to become the property of an Exhibitor winning it twice in succession or three times at intervals.					
¹ Silver Medal for the best Large Black Boar.					
15/-	25/-	161	Boar born before 1930	8	4 2
15/-	25/-	162	Boar born in 1930	6	3 1
¹ Silver Medal for the best Large Black Sow.					
15/-	25/-	163	Sow born before 1929	8	4 2
15/-	25/-	164	Sow born in 1929	8	4 2
15/-	25/-	165	Sow born in 1930	6	3 1
PRIZE MONEY BY SOCIETY			£44		
¹ CONTRIBUTED PRIZES			18		
<hr/>					
PRIZE MONEY BY SOCIETY			£182 0		
CONTRIBUTED			18 0		
CUPS, MEDALS, &c.			27 12		
Total Prizes for Pigs			£227 12		

¹ Given by Large Black Pig Society.

EXTRA STOCK

(FORMER WINNERS AND STOCK NOT ELIGIBLE FOR ORDINARY CLASSES).

Animals not included in the Classes for Competition may be exhibited as Extra Stock, and may receive Awards as follows: the Silver Medal, the Medium Silver Medal, and the Bronze Medal.

Animals entered as Extra Stock are eligible to compete for the President's Medals, whether former winners of these Medals or not. They are also eligible to compete for Special Prizes where the conditions of these Prizes permit.

If an animal appears in the Catalogue as entered in an Ordinary Class which should appear as "Extra Stock," it cannot thereafter be transferred to the "Extra Stock" Section.

Entry Fees - same as corresponding Classes.

* POULTRY

Judges: William Morgan, Classes 1 to 22, 61 to 72, and 93 to 102; William Stewart, Classes 23 to 60; George Faulkner, Classes 73 to 92; A. H. Fox-Brockbank, Classes 103 to 125.

¹ **Champion Challenge Silver Salver**, value £30, for the best exhibit in the Poultry Classes.

First Premium—ONE SOVEREIGN; *Second Premium*—TEN SHILLINGS. In each Class in which there are four or more entries a Third Prize of Five Shillings may be awarded, provided there is sufficient merit in the pens. In addition to the Premiums, the Judges may award one Very Highly Commended, one Highly Commended, and as many Commended tickets in each Class as they consider justified by the number and merit of the entries.

Champion Medals are offered as follows:—

- | | |
|--------------------------------|------------------------------|
| 1. Best Cock, any Variety. | 4. Best Pullet, any Variety. |
| 2. Best Hen, any Variety. | 5. Best Waterfowl. |
| 3. Best Cockerel, any Variety. | 6. Best Turkey. |

Aged Birds must have been hatched previous to, and Cockerels and Pullets in, the year of the Show.

Entry Fees—Members, 2s. 6d.; Non-Members, 4s.

LEGHORN—	Class	ORPINGTON—	Class
<i>White</i>	1. Cock	<i>Black</i>	29. Cock
	2. Hen		30. Hen
	3. Cockerel	<i>Any other Colour</i>	31. Cock
	4. Pullet		32. Hen
<i>Exchequer</i>	5. { Cock or	<i>Any Colour</i>	33. Cockerel
	6. { Cockerel		34. Pullet
	7. { Hen or		
	8. { Pullet		
<i>Any other Colour</i>	9. Cock	WYANDOTTE—	
	10. Hen	<i>Gold or Silver</i>	35. Cock
	11. Cockerel		36. Hen
	12. Pullet		37. Cockerel
MINORCA	13. Cock		38. Pullet
	14. Hen	<i>White</i>	39. Cock
	15. Cockerel		40. Hen
	16. Pullet		41. Cockerel
HAMBURGH	17. Cock		42. Pullet
	18. Hen	<i>Partridge</i>	43. { Cock or
	19. Cockerel		44. { Cockerel
	20. Pullet		45. { Hen or
SOOTHY GREY	21. Cock		46. { Pullet
	22. Hen	<i>Columbian</i>	47. { Cock or
	23. Cockerel		48. { Cockerel
	24. Pullet		49. { Hen or
PLYMOUTH ROCK—			50. { Pullet
<i>Barred</i>	25. Cock	<i>Any other Colour</i>	51. { Cock or
	26. Hen		52. { Cockerel
	27. Cockerel		53. { Hen or
	28. Pullet		54. { Pullet
<i>Any other Colour</i>	29. { Cock or		
	30. { Cockerel		
	31. { Hen or		
	32. { Pullet		
		RHODE ISLAND RED	49. Cock
			50. Hen
			51. Cockerel
			52. Pullet

¹ Given by the Rt. Hon. Lord Dewar. The Salver will become the property of an exhibitor who shall win it three times, not necessarily in succession.

Special Entry Forms for Poultry Classes.

* See Regulations 66 and 67.

SUSSEX—		Class	PURE-BRED FOWLS FOR LAY- ING PURPOSES—		Class
<i>Light</i>	.	53. Cock	<i>Any heavy breed</i>	.	97. { Cock or Cockerel
		54. Hen			98. { Hen or Pullet
		55. Cockerel	<i>Any light breed</i>	.	99. { Cock or Cockerel
<i>Any other Variety</i>	.	56. Pullet			100. { Hen or Pullet
		57. Cock			
		58. Hen			
		59. Cockerel			
		60. Pullet			
DORKING—			CROSS-BRED FOWLS FOR LAYING PURPOSES		
<i>Coloured</i>	.	61. Cock		.	101. Hen
		62. Hen			102. Pullet
		63. Cockerel			
		64. Pullet			
		65. Cock	DUCKS—		
<i>Silver Grey</i>	.	66. Hen	<i>Aylesbury</i>	.	103. Drake
		67. Cockerel			104. Duck
		68. Pullet			105. { Drake (young)
SCOTS DUMPY	.	69. Cock			106. { Duck (young)
		70. Hen	<i>Orpington</i>	.	107. Drake
		71. Cockerel			108. Duck
		72. Pullet			109. { Drake (young)
BARNEVELDER	.	73. Cock			110. { Duck (young)
		74. Hen	<i>Indian Runner</i>	.	111. Drake
		75. Cockerel			112. Duck
		76. Pullet	<i>Any other Variety</i>	.	113. Drake
INDIAN GAME	.	77. Cock			114. Duck
		78. Hen			
		79. Cockerel			
		80. Pullet			
OLD ENGLISH GAME	.	81. Cock	GESE	.	115. Gander
		82. Hen			116. Goose
		83. Cockerel	TURKEYS	.	117. Cock
		84. Pullet			118. Hen
BANTAM—			TABLE POULTRY—		
<i>Game—Old English</i>	.	85. Cock	(a) TABLE FOWLS—		
		86. Hen	<i>Any pure Breed</i>	.	119. Cockerel
<i>Game—Modern</i>	.	87. Cock			120. { Pair of Pullets
		88. Hen	<i>Game-Cross</i>	.	121. Cockerel
<i>Other than Game</i>	.	89. Cock			122. { Pair of Pullets
		90. Hen	<i>Any other Cross</i>	.	123. Cockerel
<i>Any Variety</i>	.	91. Cockerel			124. { Pair of Pullets
		92. Pullet			
ANY OTHER RECOGNISED BREED OF POULTRY	.	93. Cock	(b) DUCKLINGS FOR TABLE PURPOSES—		
		94. Hen	<i>Any Breed or Cross</i>	.	125. { Pair of Ducklings
		95. Cockerel			
		96. Pullet			

AMOUNT OF POULTRY PREMIUMS, £218, 15s.

Special Entry Forms for Poultry Classes.

FUR-PRODUCING RABBITS

(To be judged at 10 A.M. on Wednesday, 23rd July)

Judge : James Cattenach

REGULATIONS.

Rabbits must be brought to the Showyard between 5 P.M. and 9 P.M. on Tuesday, the first day of the Show. No lot will be admitted without an Admission Order. Pens, food, and attendance will be found by the Society.

Rabbits may be penned on Tuesday evening and removed at the close of the Show by Exhibitors themselves or their representatives. In the event of neither the Exhibitor nor an authorised representative of the Exhibitor being present to pen or remove Rabbits, they will be penned and removed by men hired and paid by the Society, but this will be done on the understanding that the men are hired to do the work on behalf of Exhibitors, and solely at their risk, and that the Society will be in no way responsible for expenses incurred or loss of or injury to Exhibits by errors or accidents in penning, despatching, or conveying Exhibits.

On the Wednesday, the second day of the Show, the Rabbit Shed will be closed to the public during the Judging. On the last day of the Show the Rabbit Shed will be closed to the public at 4 P.M.; at 5 P.M. Exhibitors or their representatives will be admitted to the Shed to remove Exhibits, provided the Exhibitor has, *not later than 11 A.M. on the last day of the Show*, given written notice to the Secretary to the effect that the Exhibitor or the Exhibitor's representative will attend at the Rabbit Shed at 5 P.M. to remove the Rabbits.

Champion Silver Medal for best exhibit in the Rabbit Classes.

First Premium—FIFTEEN SHILLINGS; Second Premium—TEN SHILLINGS; Third Premium—FIVE SHILLINGS. In each Class in which there are less than four entries the Third Prize of Five Shillings will not be awarded. In addition to the Premiums, the Judges may award *one* Very Highly Commended, *one* Highly Commended, and as many Commended tickets in each Class as they consider justified by the number and merit of the entries.

Class.

1. Angora, over 5 months.
2. Angora, not exceeding 5 months.
3. Beveren, over 5 months.
4. Beveren, not exceeding 5 months.
5. Chinchilla, Buck, over 5 months.
6. Chinchilla, Doe, over 5 months.
7. Chinchilla, Buck, not exceeding 5 months.
8. Chinchilla, Doe, not exceeding 5 months.
9. Chinchilla-Rex, any age.

Class.

10. Rex, any other colour, any age.
11. Havana, any age.
12. Sable, over 5 months.
13. Sable Marten, not exceeding 5 months.
14. Sable Siamese, not exceeding 5 months.
15. Fox, any variety, any age.
16. Any variety Fur Breed, not exceeding 5 months, for which a young class is not provided.

Entry Fee—2s. 6d. each rabbit.

PRIZE MONEY BY SOCIETY £24

Special Entry Forms for Rabbit Classes.

HONEY, &c.

Judge: Rev. John Beveridge, M.B.E., B.D.

OPEN CLASSES

Class.	Entry Fees—2s. 6d. each.	Premiums.		
		1st.	2nd.	3rd.
1. Collection of Appliances suitable for a beginner's outfit for Bee-keeping. A card naming all the articles, along with the price at which they will be supplied for one year from date, to be fixed to the exhibit		20/-	15/-	10/-
2. Best and most complete Frame Hive for general use, with any improvements. Unpainted		20/-	15/-	10/-
3. Best and most complete Hive. Unpainted. Price not to exceed 35/-		20/-	15/-	10/-
4. Six Sections of Comb Honey, excluding Heather Honey		20/-	15/-	10/-
5. Six Sections of Heather Honey		20/-	15/-	10/-
6. Six Jars of Run or Extracted Light-coloured Honey, approximate weight 6 lb.		20/-	15/-	10/-
7. Six Jars of Run or Extracted Medium or Dark-coloured Honey, excluding Heather Honey, approximate weight 6 lb.		20/-	15/-	10/-
8. Six Jars of pressed Heather Honey in liquid form, approximate weight 6 lb.		20/-	15/-	10/-
9. Six Jars of Granulated Honey, approximate weight 6 lb.		20/-	15/-	10/-
10. Two shallow Frames of Comb Honey for extracting purposes		20/-	15/-	10/-
11. Products made with the aid of Honey. (Recipe to be attached, which will be treated as confidential)		20/-	15/-	10/-
12. Best display of Honey in any form suitable for a shop window in space 4 feet by 4 feet. Weight of honey not to exceed 40 lb.		30/-	30/-	20/-
13. Best exhibit of not less than 1 lb. of Wax in any form		20/-	15/-	10/-
14. Best exhibit of not less than 1 lb. of Wax made into shapes for retail trade and over-counter trade. Convenience in packing to be taken into consideration		20/-	15/-	10/-
15. Observatory Hive with Queen and Bees—two or more frames		50/-	30/-	20/-
16. Observatory Hive with Queen and Bees—one frame, no super		40/-	30/-	15/-

(Confined to Scottish Exhibitors.)

17. One Standard Frame of Comb Honey for extracting purposes	20/-	15/-	10/-
18. Six Sections of Comb Honey, excluding Heather Honey	20/-	15/-	10/-
19. Six Sections of Heather Honey	30/-	20/-	10/-
20. Six Jars of Run or Extracted Medium or Dark-coloured Honey, excluding Heather Honey, approximate weight 6 lb.	30/-	20/-	10/-
21. Six Jars of Run or Extracted Light-coloured Honey, approximate weight 6 lb.	30/-	20/-	10/-

Silver and Bronze Medals will be awarded by the Scottish Bee-Keepers' Association to the First and Second winners of the greatest number of points in Classes 4-21, calculated on the following basis: 1st prize, 8 points; 2nd prize, 2 points; 3rd prize, 1 point.

Championship Cup, value £5, 5s.—This cup has been gifted by the Rev. John Beveridge, M.B.E., B.D., Edinburgh, and will be held for one year by the winner of the Silver Medal, ultimately becoming the property of the first competitor to score 100 points.

PRIZE MONEY BY SOCIETY £47, 0s. 0d.

CONTRIBUTED BY SCOTTISH BEE-KEEPERS' ASSOCIATION £10, 10s. 0d.

CHAMPIONSHIP CUP £5, 5s. 0d.

Special Entry Forms for Appliances and Honey.

Should there be in any Class three or less than three entries, the value of the first prize will be reduced to that of the second, the second to that of the third, and no third prize will be awarded.

RULES AND REGULATIONS.

1. All exhibits must be despatched in time to be delivered at the Showyard not later than 6 P.M. on Monday, the day before the opening of the Show. According to the railway regulations, exhibitors will require to pay return carriage and cartage when despatching. Return carriage-paid labels will be supplied by the Secretary, and must be addressed for the return journey, and have numbers of Classes on same. Non-compliance with this regulation will mean that the exhibit will be left in the Showyard. **Boxes containing hives, jars, or sections must be screwed and not nailed, and the hives, bottles, and sections so placed that they can be lifted out and replaced without disturbing the packing.**

2. The number of the exhibit will be sent by the Secretary (as entered on the card), and must be placed on every exhibit and on each detachable part of exhibit—viz., on every jar of Extracted Honey. The number must be gummed on the side of the jar at the foot and not on the bottom or cap. No goods will be allowed to be staged unless this rule is complied with.

3. No card, trade mark, or name of the exhibitor may be placed upon any part of an exhibit. Every article exhibited must be the property of the exhibitor, and all honey must have been gathered in the natural way within Great Britain, Northern Ireland, and Irish Free State, by bees the property of the exhibitor.

4. Comb Honey must be glazed on both sides, to protect the honey from injury. If paper edging is used, it must be of such a width as to leave $3\frac{1}{4}$ inches by $3\frac{1}{4}$ inches of glass clear of the lace paper, or in any other neat way capable of easy removal by the Judges, in small boxes glazed on both sides, such as supplied by dealers.

5. All Run, Extracted, and Granulated Honey must be shown in the usual mercantile Glass Jars holding approximately 1 lb., except in Class 12.

6. No exhibitor shall be allowed to take more than one prize in any one class.

7. The Judge shall be empowered to withhold prizes in case of insufficient merit.

8. Should there be in any class three or less than three entries, the value of the first prize will be reduced to that of the second, the second to that of the third, and no third prize will be awarded.

9. The Judge will commence his inspection at 11 A.M. on Tuesday, and the Bee Shed will be closed to the public during the judging.

10. Exhibits of Honey may be placed in their positions in the shed before the opening and removed at the close of the Show by exhibitors themselves or their representatives. In the event of neither the exhibitor nor a person with written authority from the exhibitor being present to place or remove the exhibits, they will be placed and removed by men hired and paid by the Society, but this will be done on the understanding that the men are hired to do the work on behalf of the exhibitors, and solely at their risk, and that the Society will be in no way responsible for expenses incurred or loss of or injury to exhibits by errors or accidents in placing, despatching, or conveying exhibits. In the case of exhibits which are not removed by 5.30 P.M. on the closing day of the Show, the Society will hold itself at liberty to hand them over to the railway companies for despatch to the respective exhibitors.

11. No lot can be removed from the yard till 4 P.M. on Friday, the last day of the Show.

12. The Society undertakes no responsibility for the receipt or despatch of exhibits, nor for any injury exhibits may sustain during the Show or otherwise.

13. **Railway delivery charges from station to Showyard and back to be paid by exhibitor. See p. 88.**

* DAIRY PRODUCE

Judge: R. G. Gilchrist

No Exhibitor to show more than **one** lot in any Class

Entry Fees—Members, 5s.; Non-Members, 7s. 6d.

Class	Premiums.				
	1st.	2nd.	3rd.	4th.	5th.
1. Powdered Butter, not less than 8 lb.	£ 4	£ 2	£ 1	—	—
2. Fresh Butter, three 1-lb. rolls	4	2	1	—	—
3. Cheddar Cheese, 56 lb. and upwards	9	5	3	2	1
4. Cheese, 14 lb. and under	5	3	2	1	—
Total	£45				

Special Entry Forms for Dairy Produce.

* See Regulations 75 and 76.

Railway delivery charges from station to Showyard and back to be paid by exhibitor. See p. 88.

W O O L

Judge : George Stewart

THREE Fleeces in each Entry. Each fleece must be shown entire. Entry Fee, 5s.

PURE BREED CLASSES

							Premiums.		
							1st.	2nd.	3rd.
Class	*BLACKFACE.						£	£	£
1. Ewe	3	2	1
2. Hogg	3	2	1
CHEVIOT.									
3. Ewe	3	2	1
4. Hogg	3	2	1
BORDER LEICESTER.									
5. Ewe	3	2	1
6. Hogg	3	2	1
HALF-BRED.									
7. Ewe	3	2	1
8. Hogg	3	2	1
OXFORD-DOWN.									
9. Ewe	3	2	1
10. Hogg	3	2	1
SUFFOLK.									
11. Ewe	3	2	1
12. Hogg	3	2	1
DORSET HORN.									
13. Ewe	3	2	1
14. Hogg	3	2	1
† SHETLAND.									
Special Prizes to be awarded for Shetland Wool actually grown in Shetland							.	.	.
15. Ewe	3	2	1
16. Hogg	3	2	1

TOTAL PRIZE MONEY FOR WOOL, £102.

Cheviot, Border Leicester, and Half-Bred Fleeces must be shown washed, and Blackface and Shetland Fleeces unwashed. All Fleeces must be shorn in the year of the Show from sheep bred and reared on, or regular stock of, the exhibitor's farm.

Special Entry Forms for Wool Classes.

* Blackface Ewe Fleeces shall be not less than 4½ lb., and Hogg Fleeces not less than 6 lb. in weight.

† An exhibit of Shetland Wool may comprise fleeces of one or more colours, but each fleece must be self-coloured.

Railway delivery charges from station to Showyard and back to be paid by exhibitor. See p. 88.

RURAL INDUSTRIES

Judges : Miss Bruce, Classes 1, 2, 3, 4, 5, 6, 15, 16, and 23 ; Miss D. Affleck, Classes 7, 21, and 25 ; Miss Ann Macbeth, Classes 8, 9, 13, 18, 19, 20, 22, and 24 ; Miss A. Knox-Arthur, Classes 10, 11, 14, and 17 ; Mrs Balfour Graham, Class 12.

Entry Fees, 2s. 6d. each article.

OPEN CLASSES.

SHETLAND KNITTING.

Class.	<i>Exhibits to be made from Shetland Wool.</i>	Premiums.		
		1st.	2nd.	3rd.
1.	Fine Lace Goods (separate entry for each article)	£3	£2	£1
2.	Jumper, Sports Coat, Cardigan, or Waistcoat—one or more colours	3	2	1
3.	Jumper, Sports Coat, Cardigan, or Waistcoat—all over Fair Isle	3	2	1
4.	Exhibits other than above (separate entry for each article)	2	1	10/-

TWEEDS.

5.	Harris or other Tweed—Hand-spun, Hand-woven, and Vegetable-dyed	3	2	1
6.	Tweed—Mill-spun, Hand-woven	3	2	1

MISCELLANEOUS.

7.	Home-made Floor Rug (wool)	3	2	1
8.	Specimen of Embroidery—white (to be exhibited unwashed)	3	2	1
9.	Specimen of Embroidery—coloured	3	2	1
10.	Leather Gloves	2	1	10/-
11.	Specimen of Leather Work other than Gloves	2	1	10/-
12.	" Furcraft	2	1	10/-
13.	" Hand-painted Pottery	2	1	10/-
14.	" Basket Work (Raffia not eligible)	2	1	10/-
15.	Best collection of Vegetable-dyed Wools	2	1	10/-
16.	Home-spun Yarn—2-3 cuts	2	1	10/-
17.	Specimen of Filet-lace	3	2	1
				£82 0

CONFINED CLASSES.

Open to Women's Rural Institutes and Members thereof in the whole of Scotland.

		Premiums.		
		1st.	2nd.	3rd.
18.	Embroidered Bag—Petit Point included	£3	£2	£1
19.	Specimen of Italian Quilting	3	2	1
20.	" Quilting other than Italian	3	2	1
21.	Article made from Binder Twine	3	2	1
				£24 1

RURAL INDUSTRIES—continued.

Confined to Women's Rural Institutes and Members thereof in the South-Western Area of Scottish Women's Rural Institutes.

	Premiums.		
	1st.	2nd.	3rd.
22. Carded Wool Quilt, single or double bed size (may be co-operative)	£2	£1	10/-
23. Knicker Stockings, Fancy Tops—5-ply fingering	2	1	10/-
24. Child's Frock, all handsewn—cotton material (size, under 10 years)	2	1	10/-
25. Floor Rug, lined—made from old material	2	1	10/-
Special Prizes to the Institutes winning the largest number of prizes in Classes 22 to 25 inclusive.			
First Prize to count six points, Second Prize five points, Third Prize four points, V.H.C. three points, H.C. two points, and C. one point			
	2	1	—
			£17 0

PRIZE MONEY BY SOCIETY £76 0

Contributed Prize Money—

<i>Central Council of Scottish Women's Rural Institutes, for Classes 18-21</i>	£24 0
<i>South-Western Area of Scottish Women's Rural Institutes, for Classes 22-25</i>	£17 0
<i>Mrs I. A. Simpson, Edinburgh, for Class 17</i>	£6 0

NOTE.—(a) No exhibit may be entered in more than one Class.

(b) All exhibits must have been made within the twelve months preceding the Show.

REGULATIONS.

1. The Competition, except where otherwise stated, is open to competitors from all parts of Great Britain, Northern Ireland, and Irish Free State. Societies or Institutes, as well as individuals, shall be allowed to compete.

2. Every exhibit must be the work either of the exhibitor or of a member of the exhibiting Society or Institute, and must have been made within the twelve months preceding the Show.

3. An entry fee of 2s. 6d. for each exhibit is payable at the time of entry.

4. Exhibits will be received in the Showyard not later than 8 p.m. on Monday, the day before the opening of the Show. Judging will commence at 9.30 a.m. on Tuesday. The section will be closed to the public during the judging. Exhibits shall not be removed till after the close of the Show.

5. In no case shall a prize be awarded unless the Judge deems the exhibit to have sufficient merit; and where only one or two articles are entered in a class, and the Judge considers them unworthy of the prizes offered, it shall be in his or her power to award a lower prize.

6. Exhibits shall be entirely at the risk of exhibitors, who shall be solely responsible for delivery and removal of their own exhibits. In the event of neither the exhibitor nor a person with written authority from the exhibitor being present to place or remove exhibits, these will be placed and removed by men hired and paid by the Society; but this will be done on the understanding that the men are hired to do the work on behalf of the exhibitors and solely at their risk, and that the Society will be in no way responsible for expenses incurred or loss of or injury to exhibits by errors or accidents in placing, despatching, or conveying exhibits. A receipt signed by the exhibitor, on a form to be issued by the Secretary, must be delivered before any exhibit is handed over to the exhibitor or his or her representative.

7. Exhibitors shall be allowed to attach to their exhibits a notice indicating where (in the Showyard or elsewhere) similar articles may be purchased.

8. Exhibits must not be sent to the Society's Office previous to date of Show. Labels, &c., will be posted to Exhibitors about fourteen days prior to the Show.

9. **Railway delivery charges from station to Showyard and back to be paid by exhibitor. See p. 88.**

Special Entry Forms for Rural Industries Section.

HORSE SHOEING

Judges: James Lindsay, M.R.C.V.S.; Robert Fenwick; George Marshall.

Open to Shoeing-Smiths from any part of Great Britain, Northern Ireland, and Irish Free State.

Horses provided for this Competition cannot be entered in any other Class.

THURSDAY, 24TH JULY.

Class 1.—FARM HORSES (Open Class).

1st Prize, £5 and Clock.*	8th Prize, £2.
2nd Prize, £5 and Canteen of Cutlery.†	7th Prize, £2.
3rd Prize, £5 and Gold Medal.‡	8th Prize, £1.
4th Prize, £4 and Gold Medal.§	9th Prize, £1.
5th Prize, £3.	

FRIDAY, 25TH JULY.

Class 2.—FARM HORSES (Juniors under Twenty-five Years of Age).

1st Prize, £5 and Gold Watch.**	3rd Prize, £2 and Gold Medal.‡
2nd Prize, £3 and Canteen of Cutlery.†	4th Prize, £1.

* Clock given by the Scottish Iron and Steel Co., Ltd., Glasgow.

** Gold Watch given by Messrs William Martin, Sons, & Co., Coatbridge.

† Canteens of Cutlery given by Messrs Neilson & Cleland, Ltd., Coatbridge.

Gold Medal given by the National Master Farriers' and Blacksmiths' Association, to be awarded to the competitor obtaining the highest number of points in either competition.

‡ Gold Medals given by the Mustad Nail Company.

§ Gold Medal given by Capewell Horse Nail Company.

PRIZE MONEY BY SOCIETY	£24
CLOCK AND £10 BY THE SCOTTISH IRON & STEEL CO., LTD., GLASGOW	£15
GOLD WATCH AND £5 BY MESSRS WILLIAM MARTIN, SONS, & CO., COATBRIDGE	£10
CUTLERY BY MESSRS NEILSON & CLELAND, LTD., COATBRIDGE	£8
GOLD MEDAL GIVEN BY NATIONAL MASTER FARRIERS' AND BLACKSMITHS' ASSOCIATION	£4
GOLD MEDALS BY MUSTAD NAIL CO.	£4
GOLD MEDAL BY CAPEWELL HORSE NAIL CO.	£2

1. Entries must be made with the Secretary not later than 29th May. Entry Fee, 2s. 6d. for each Class. Entry Forms may be had on application.

2. The Competition will take place in the Showyard, and will be decided by points, time being taken into consideration. Each Competitor must make and fix one fore and one hind shoe, having previously taken off the old shoes. The shoes must be fullered, with low calkins, and with toe-pieces on hind shoes only. The use of files and wire brushes is not permitted. Each Competitor must bring his own tools, nails, and a striker. The striker will not be allowed to touch the horse's hoof. The local Blacksmiths' and Farriers' Association will provide forges and anvils. The horses to be shod will be provided by the Association. Forges and horses will be balloted for.

3. Competitors must attend at the Horse-Shoeing Stance and answer to their names half an hour before they are due to compete.

4. The Competitor and his striker will be admitted to the Yard free of charge on the day of Competition on presentation of tickets which will be sent to the Competitor for the purpose.

The Waverley horse-shoe iron to be used in the Open Class, and the Dundivan horse-shoe iron to be used in the Junior Class, will be supplied by Messrs Neilson & Cleland, Ltd., Coatbridge, who will also provide the necessary smithy coal.

Special Entry Forms for Horse-Shoeing Classes.

LIVE STOCK JUDGING COMPETITION.

1. The Society will hold a Live Stock Judging Competition on Thursday, 24th July, commencing at 10.30 A.M.

2. The Competition shall be open to all persons not exceeding 23 years of age at the date of the Competition.

3. Teams from Agricultural Colleges or from Young Farmers' Clubs in Scotland shall be allowed to compete. The members of these teams shall also enter as individual Competitors. Five members shall form a team.

4. Entries must be lodged with the Secretary of the Highland and Agricultural Society not later than 10 A.M. on Thursday, 19th June. An entry fee of 2s. 6d. shall be paid by each Competitor. Entries of teams must be made in the same way, but no additional fee shall be charged for a Team over and above the fee of 2s. 6d. for each individual member.

5. The Stock to be judged shall consist of—

(a) Cattle (three classes)	.	.	.	{ Shorthorn.
				{ Galloway.
(b) Horses (two classes)	.	.	.	{ Ayrshire.
				{ Clydesdales.
(c) Sheep (three classes)	.	.	.	{ Blackface.
				{ Cheviot.
				{ Border Leicester.

There will be four animals in each class. The animals to be judged shall be chosen by the Society's Stewards. The Society reserves the right to modify the nature of the classes should difficulty arise in finding suitable material amongst the animals exhibited at the Show.

6. In Judging, breed type shall be taken into account. All stock shall be considered free from acquired blemishes or unsoundness. The Competitors shall judge in groups, and ten minutes shall be allowed for the judging of each class.

7. Competitors are forbidden to discuss the Stock with each other, or with any other person, until the conclusion of the whole Competition.

8. The method of awarding points shall be decided by the Directors of the Society, and their decision in all matters relating to the Competition shall be final.

9. Prizes shall be awarded as follows :—

Individual Competition	.	.	.	£5, £4, £3, £2, £1.
Team Competition—				
1st . . . . .	.	.	.	£10 and 5 Medium Silver Medals.
2nd . . . . .	.	.	.	£5 and 5 Medium Bronze Medals.
Special Prize for College				
team placed highest in				
competition	.	.	.	£5.

¹ 'Glasgow Herald' Challenge Cup, value £50, to be awarded each year to the winning team in the Inter-College Contests.

¹ Gold Medal to be awarded to the highest individual scorer, irrespective of whether the winner is or is not a College Entrant.

The Society reserves the right to reduce the number of prizes in the event of there being less than twenty Competitors in the individual Competition and less than three teams in the team Competition.

¹ Given by Messrs George Outram & Co., Ltd., Glasgow.

ABSTRACT OF PREMIUMS.

GIVEN BY THE SOCIETY.

Cattle . . .	£1344	0	0
Horses . . .	976	12	0
Jumping Competitions . . .	179	0	0
Sheep . . .	565	0	0
Goats . . .	42	0	0
Pigs . . .	182	0	0
Poultry . . .	218	15	0
Fur-Producing Rabbits . . .	24	0	0
Honey, &c. . .	47	0	0
Dairy Produce . . .	45	0	0
Wool . . .	102	0	0
Rural Industries . . .	76	0	0
Horse Shoeing . . .	24	0	0
Stock Judging Competition . . .	35	0	0
Medals to Breeders, &c. . .	40	0	0
Forestry ¹ { . . .	40	0	0
	£8940	7	0

CONTRIBUTED PRIZES, CUPS, &c.

Champion Medals . . .	31	0	0
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CATTLE.

*The late Mr William Duthie—Silver Cup . . .	£150	0	0
*Mr Emilio R. Casares, jun., London—Cup . . .	50	0	0
The Shorthorn Society (and 2 Medals) . . .	40	0	0
*Mr W. Gilchrist Macbeth—Silver Cup . . .	50	0	0
*The late Sir George Macpherson Grant, Bart.—Silver Cup . . .	50	0	0
*Mr Eduardo Estanguet, Argentina—Silver Cup . . .	52	10	0
*The late Sir John Macpherson Grant, Bart.—Silver Cup . . .	50	0	0
*Mr Falconer L. Wallace—Silver Cup . . .	50	0	0
Aberdeen-Angus Cattle Society—Gold Medal . . .	10	0	0
*Paisley Perpetual Gold Challenge Cup . . .	300	0	0
*Galloway Cattle Society—Dr Gillespie Memorial Trophy . . .	50	0	0
*Mrs Brown, Kirkbriex, Glasgow—Knockbriex Challenge Cup . . .	50	0	0
*Highland Cattle Society of Scotland—Silver Cups . . .	89	5	0
*Fife and Kinross Perpetual Gold Challenge Cup . . .	200	0	0
*Cowhill Champion Cup . . .	30	0	0
Ayrshire Cattle Hard-Book Society . . .	20	0	0
Messrs Brown & Polson, Ltd. . . .	8	0	0
The Hon. T. G. P. Corbett . . .	6	0	0
British Friesian Cattle Society . . .	40	0	0
*Lady Rachel Workman MacRobert—Champion Bell . . .	52	10	0
*Lt.-Colonel Charles Brook—Kinmount Challenge Cup . . .	50	0	0
Red Poll Cattle Society . . .	20	0	0

1418 5 0

HORSES.

*Clydesdale Horse Society—Cawdor Challenge Cups . . .	£105	0	0
*Mr William Meiklem, Kirkcaldy—Gold Challenge Cup . . .	115	10	0
"William Taylor" Memorial Committee . . .	10	0	0
Shire Horse Society . . .	27	4	0
Suffolk Horse Society . . .	27	4	0
Dumfriesshire Hunt, Dumfries Centenary Silver Challenge Cup . . .	100	0	0
Hunters' Improvement and National Light Horse Breeding Society—Gold Medal . . .	10	0	0
Department of Agriculture for Scotland . . .	40	0	0
National Pony Society . . .	10	0	0
The Highland Pony Society . . .	10	0	0
"Four Lovers of the Breed" (Shetland Ponies) . . .	10	0	0
Shetland Pony Stud-Book Society (Medal). . .			
*Glasgow Challenge Cup . . .	50	0	0

514 18 0

Carry forward . . .

£5904 10 0

¹ Grant to Royal Scottish Arboricultural Society for Forestry Section.

* Challenge Prizes.

ABSTRACT OF PREMIUMS—*continued*

Brought forward	.	.	.	£5904	10	0
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SHEEP.

*Renfrewshire Perpetual Gold Challenge Cup	.	.	£250	0	0
Tweeddale Gold Medal	.	.	25	0	0
Society of Border Leicester Sheep-Breeders—Gold Medals	.	.	20	0	0
*Challenge Bowl for Oxford-Down Sheep	.	.	50	0	0
Oxford-Down Sheep-Breeders' Association	.	.	21	0	0
Suffolk Sheep Society	.	.	15	0	0
Dorset Horn Sheep-Breeders' Association	.	.	5	0	0
Leicester Sheep-Breeders' Association	.	.	10	0	0
Wensleydale Longwool Sheep-Breeders' Association	.	.	10	0	0
				406	0 0

GOATS.

Department of Agriculture for Scotland	.	.	£12	0	0
*British Goat Society—Male Challenge Cup	.	.	10	10	0
*Lord Dewar—Silver Cup	.	.	21	0	0
*Mrs S. Macdonald—Silver Cup	.	.	10	0	0
				53	10 0

PIGS.

National Pig-Breeders' Association—Gold and Silver Gilt Medals or Cash	.	.	£15	0	0
*Large Black Pig Society—Silver Cup	.	.	12	12	0
Large Black Pig Society (and 2 Medals)	.	.	18	0	0
				45	12 0

POULTRY.

*Lord Dewar—Champion Challenge Silver Salver	.	.		30	0 0
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HONEY.

The Scottish Bee-Keepers' Association (and 2 Medals)	.	.	£10	10	0
*Rev. John Beveridge, M. B. E., Championship Cup	.	.	5	5	0
				15	15 0

RURAL INDUSTRIES.

Central Council of Scottish Women's Rural Institutes	.	.	£24	0	0
South-Western Area of Scottish Women's Rural Institutes	.	.	17	0	0
Mrs I. A. Simpson, Edinburgh	.	.	6	0	0
				47	0 0

HORSE SHOEING.

The Scottish Iron & Steel Co., Ltd., Glasgow (Clock and £10)	.	.	£15	0	0
Messrs W. Martin, Sons, & Co., Coatbridge (Gold Watch and £5)	.	.	10	0	0
Messrs Neilson & Cleland, Limited, Coatbridge (Cutlery)	.	.	8	0	0
National Master Farriers' and Blacksmiths' Assoc. (Gold Medal)	.	.	4	0	0
Mustad Nail Co. (2 Gold Medals)	.	.	4	0	0
Capewell Horse Nail Co. (Gold Medal)	.	.	2	0	0
				43	0 0

STOCK JUDGING COMPETITION.

*Messrs George Outram & Co., Ltd., Glasgow—'Glasgow Herald' Challenge Cup (and Gold Medal)	.	.	.	50	0 0
				£6595	7 0

* Challenge Prizes.

JOHN STIRTON, *Secretary.*8 EGLINTON CRESCENT,
EDINBURGH, *March 1930.*

SILVER MEDALS FOR NEW OR IMPROVED IMPLEMENTS.

See Regulations on page 84.

FORESTRY EXHIBITION.

For information as to above, apply to the Secretary,* Royal Scottish Arboricultural Society, 8 Rutland Square, Edinburgh.

WOOL DEMONSTRATIONS.

Arrangements are being made for Demonstrations on Wool, to be held in the Wool Shed on Wednesday, Thursday, and Friday, 23rd, 24th, and 25th July.

**The Society's Show for 1931 will be held
at Edinburgh.**

MEMBERS ADMITTED SINCE THE LIST WAS PUBLISHED IN APRIL 1929.

ARRANGED ACCORDING TO SHOW DISTRICTS.

(ELECTED 5TH JUNE 1929 AND 8TH JANUARY 1930.)

1.—GLASGOW DIVISION

ARGYLL

Admitted
1929 Anderson, Peter, Sandbank, Taynuilt
1929 Anderson, Mrs Peter, Sandbank, Taynuilt
1930 Campbell-Freston, Mrs Mary, of Ardchattan, Ardchattan Priory, Taynuilt
1930 Grant-Forman, Captain George E. G., The Lodge, Douglas Pier, Loch Goll
1929 Fisher, Neil, Couston, Colintraiue
1929 Lees-Milne, Alexander Milne, of Knock, Knock House, Grulline, Isle of Mull
1929 M'Donald, William, Columba Buildings, Oban
1930 Nelson, Thomas Ernest, of Achnacloich, Connel

AYR

1930 Billyard-Leake, Commander E. W., Hollybush House, Hollybush
1930 Borland, T. W., Meadow View, Irvine
1930 Brown, James, Gatehead, New Cumnock
1930 Caldwell, Henry, Corsehills, Dregghorn
1930 Duncan, Allan E., Knoweside, Maybole
1930 Gardner, W., M.R.C.V.S., Woodside, Maybole
1930 Millar, John (Daniel Wyllie & Co., Ltd.), 197 High Street, Ayr
1929 Montgomerie, Hugh, Littlestane, Irvine
1929 Murray, Lieut.-Colonel Charles Hope, of Morishill, Beith
1930 Murray, David, 13 St Leonard's Road, Ayr
1930 Rodger, Henry, 11 York Street Lane, Ayr
1930 Watson, Alexander D., jun., Barboigh, Mauchline
1930 Watson, James A., High Tarbeg, Ochiltree
1930 Watson, John Wilson, Barboigh, Mauchline
1929 Watson, Miss Joyce, Dunlop House, Dunlop
1930 Watson, William, Cowhillan, Ochiltree
1930 Wyllie, John G. C. (Daniel Wyllie & Co., Ltd.), 197 High Street, Ayr

BUTE

1930 M'Alister, James, Meikle Kilmory, Rothessay
1930 M'Millan, William, Millbrae, Ascog, Rothessay
1929 Orr, Stewart, Corrie House, Corrie, Arran
1929 Orr, Mrs Stewart, Corrie House, Corrie, Arran

LANARK

1930 Baxter, Robert, Main Street, Cleland
1929 Blue, Alexander, 65 Pitt Street, Glasgow, C.3
1930 Brown, G. J. L., c/o Edmiston, Brown & Co., Ltd., 45 Midwharf Street, Glasgow
1930 Chambers, William, Ardchattan, Cameron Street, Motherwell
1929 Clark, Andrew, Loanhead Farm, Biggar
1930 Clark, William, Windlaw Farm, Carmunnock
1929 Cubbage, Percy A., 62 Robertson Street, Glasgow
1930 Fleming, Alexander R., Raith Farm, Bothwell
1929 Foster, William (United Glass Bottle Manufacturers, Ltd.), 62 Robertson Street, Glasgow, C.2
1929 Galbraith, Alexander J. D., Biggar-shiels, Biggar
1930 Jamieson, William, Budshaw Farm, Chapelhall, Shotts
1930 Macdonald, David C., 93 Ardshiel Road, Glasgow, S.W.
1929 M'Ilchere, Malcolm, Carlside Farm, Thorntonhall
1930 M'Kie, Roger Alexander, c/o The Texas Oil Co., Ltd., 38 Bath Street, Glasgow
1930 Macrae, Donald, 61 West Regent Street, Glasgow
1929 Robertson, R. B. (Shields & Ramsay, Ltd.), 104 West George Street, Glasgow
1929 Roddan, Robert O., 82 St Vincent Street, Glasgow
1929 Scott, W. S., Royal Exchange Assurance, 91 West George Street, Glasgow
1929 Struthers, Robert Jaek, Broomfield, Ashgill
1929 Tennant, James, Hillhouse, Sandilands, Lanark
1930 Walker, James, Easter Moffat Farm, Plains, by Airdrie
1929 Wilson, Alexander, South Cairnduff, Strathaven

RENFREW

1929 Barrie, Isaac, 8 Keir Street, Pollok-shields
1929 Buchanan, John Craig, Hunterhill, Paisley
1930 Clark, Robert H., Arnothill, Arthurlie Street, Barrhead
1929 Magee, Mrs Florence, Roebank, Johnstone

2.—PERTH DIVISION**FIFE**

- 1929 Adamson, James R., Bruckley, Dairsie
 1929 Addison, Thomas, 14 Comely Park, Dunfermline
 1929 COCHRANE, Lady, of Cultra, Crawford Priory, Springfield
 1929 Orichton, Adam, Contractor, Kinglassie, Cardenden
 1929 Curtis, James R., Blacksmith, Gateside
 1930 Greig, Martin G., Royal Bank of Scotland, Cupar-Fife
 1930 Lumsden, T. D., Logie, Cupar-Fife
 1930 Marshall, Miss Jean, Lochmalony, Cupar-Fife
 1930 Marshall, Miss Margaret H., Lochmalony, Cupar-Fife
 1929 Millar, Miss E. A., Inveriel, Kirkcaldy
 1930 Patterson, George, Denhead, Dunfermline
 1929 Scott, Mrs John, Viewfield Terrace, Dunfermline
 1930 Stewart, Mrs Ethel May, Keavil, near Dunfermline
 1930 Watson, Robert Pittendrigh, National Bank House, Anstruther
 1930 Wylie, James, Bowhouse Farm, Kinglassie
 1929 Zulli, William, Tapitlaw Farm, Oakley

ANGUS**(WESTERN DISTRICT)**

- 1929 Bathie, Neil Ferguson, 17 Fairfield Road, Dundee
 1930 Brand, William Farquhar, 6-8 North Lindsay Street, Dundee
 1930 Buchan, William, Auchterforfar Farm, Forfar
 1929 Duncan, Alfred A., Balkembeck, Tealing, Dundee
 1929 Garthwaite, Major Alan, D.S.O., M.C., Airliie Estates Offices, Cortachy, Kirriemuir
 1929 Herd, Captain T. A., Barns of Claverhouse, Dundee
 1930 Stewart, John, Kirkton of Lundie, Lundie

- 1929 OGILVY, The Lady Christian, Baldovan House, Dundee
 1930 Thomson, William, Tobees Farm, Oathlaw, Forfar

KINROSS

- 1930 Dawson, Miss Ada Ramage, Balado, Kinross
 1930 Dawson, Mrs Ramage, Balado, Kinross
 1929 Russell, David, Mawhill, Kinross

PERTH**(PERTH SHOW DISTRICT)**

- 1930 Black, Hugh S., Banchory, Coupar-Angus
 1930 Bow, Alexander P., Belhie Farm, Auchterarder
 1929 Brewster, James, Tarrylaw Farm, Balbeggie, by Perth
 1929 Buchanan, Captain Angus, Estate Office, Coupar Grange, Coupar-Angus
 1930 Buchanan, George A., Gask, Auchterarder
 1930 Buchanan, Mrs George A., Gask House, Auchterarder
 1929 Butter, Miss Jean M., Clunimore, Pitlochry
 1929 Butter, Miss Margaret E., Clunimore, Pitlochry
 1929 Collier, David, Eastbank, Longforan
 1930 Dalgleish, Thomas, West Mains, Auchterarder
 1930 Dewar, Hon. H. E. A., Dupplin Castle, Perth
 1929 Drummond, Mrs, of Megginch, Megginch Castle, Errol
 1929 Howard, Miss Winifred, Organiser, S.W.R.I., 8 Kinnoull Street, Perth
 1929 Hunter, Miss Emily, Arngask, Glenfarg
 1930 M'Glashan, G. T., Summerbank, Western Road, Auchterarder
 1930 Milne, James I., The Square, Aberfeldy
 1930 Nicol, David, Auchtenny, Forquardenny
 1929 Peebles, Robert, The Cottage, Balbeggie
 1929 Sandeman, Mrs Alastair, Fonab, Pitlochry

3.—STIRLING DIVISION**CLACKMANNAN**

- 1929 Buick, Charles G. (Charles Buick & Sons), Hilton Fire Clay Works, Alloa
 1929 Cram, James B., Glensherup, Glendevon, Dollar
 1929 Gray, Atherton, Washington House, Alva
 1929 Gray, John, 15 Claremont, Alloa
 1929 Gray, Robert C., Burnside, Alva
 1929 Henderson, Alexander Wilson, Westerton Farm, Dollar
 1929 Henderson, George Younger, Nether Carsebridge, Alloa
 1929 Hogg, Thomas M., Devonside, Tillicoultry
 1930 Izat, Lieut. Colonel William R., D.S.O., of Balliliesk, Dollar
 1929 Jamieson, William, "Ashdale," 43 Hill Street, Tillicoultry

- 1929 Kerr, William, Mar Street, Alloa
 1930 Lawson, Miss E., George Street, Alva
 1929 Lawson, Thomas, Dairyman, George Street, Alva
 1929 M'Gee, Ian P., Blackfaulds, Sauchie, Alloa
 1929 M'Queen, Robert Russell, jun., Boll Farm, Alva
 1929 Pollock, Alexander, 66 Ochil Street, Tillicoultry
 1929 Richardson, David, 8 Mill Street, Alloa
 1929 Russell, Thomas L., Forestmill, Clackmannan
 1929 Sinclair, George, Glendevon, Dollar
 1929 Spence, W. O., Clydesdale Bank, Alloa
 1929 Stirling, Robert, Parkhead, Alloa
 1929 Stirling, William, Parkhead Farm, Alloa
 1929 Telfer, Andrew, The Whins, Alloa
 1929 Waddell, James S., High Street, Tillicoultry

DUMBARTON

- 1929 Adams, James M., 8 Station Road, Dumbarton
- 1930 Blair, Andrew J., jun., Gellston Farm, Cardross
- 1930 Blair, Mrs Andrew J., Gellston Farm, Cardross
- 1929 Christison, John, Crossveggate Farm, Milngavie, Dumbarton
- 1929 Cowleson, F. D., Mains of Kilmarnock, by Alexandria
- 1929 Duncan, Walter, Wester Dullatur, Dullatur
- 1929 Farquhar, Andrew, Middleton Farm, Bowling, Dumbarton
- 1929 Smith, Alexander C., 120 East King Street, Helensburgh
- 1929 Turner, Peter, Oxbag, Kirkintilloch
- 1929 Young, William, Dalmoak Farm, Dumbarton

PERTH

(STIRLING SQUAD DISTRICT)

- 1930 Buchanan, Mrs J. C. H. Gray, Craigie Cottage, Port of Menteith
- 1929 Cameron, John, Corrie, Gartmore
- 1930 Connell, Charles, Colquhaisie, Muthill
- 1929 Cullens, Hugh, Harperstone, Braco
- 1929 Cumming, Thomas, Easter Hill, Gartmore
- 1930 Ferguson, William, Commercial Hotel, Thornhill
- 1929 Graham, George A., Rossburn Lane, Blair Drummond
- 1929 Henderson, Donald James, Glenhead, Dunblane
- 1929 Henderson, Joseph, Woodlee, Dunblane
- 1930 King, J. R. C., Manager, Glasgow Corporation Waterworks, Trossachs, Callander
- 1929 M'Beath, Daniel, Main Street, Thornhill
- 1930 M'Cowan, Miss Margaret E., Monzie Castle, Crieff
- 1929 M'Laggan, Thomas R., Williamston, Madderty, Crieff
- 1929 MacLaren, Archibald D., Drummorie, Doune
- 1929 M'Laren, John, Fintalich, Muthill
- 1929 M'Laren, John, Kirkton, Balquhider, by Strathrye
- 1929 MacLaren, Thomas, Drummorie, Doune
- 1929 Paterson, George, Causewayend, Doune
- 1929 Roy, Alexander E., 6 High Street, Crieff
- 1929 Stewart, John, Mallermore, Comrie
- 1929 Stewart, William, Dykedale Farm, Dunblane
- 1929 Strang, James F., Kintochoer, Crieff

STIRLING

- 1929 Aitkenhead, Charles, Haining Valley, Linlithgow (Stirling District)
- 1929 Aitkenhead, Walter A., jun., Haining Valley, Linlithgow (Stirling District)

- 1929 Allan, James, Machar House, Killearn
- 1929 Bain, John, Crawtree, Kippen
- 1930 Baird, Matthew Miller, B.Sc., F.R.H.S., High School, Balfour
- 1930 Bartholomew, Miss Eliza, Glenorchard, Torrance, near Glasgow
- 1929 Binnie, William, Braes, Denny
- 1929 Blyth, Matthew, 27 Forth Crescent, Stirling
- 1929 Burgess, John W., M.R.C.V.S., Springbank, Buchlyvie
- 1929 Carlin, Robert, Shore House, Stirling
- 1929 Christie, James, Auchentroig, Balfour Station
- 1929 Christie, John, West Carse, Stirling
- 1929 Crooble, Thomas, 26 Snowdon Place, Stirling
- 1930 Donald, William, Galdrew, Drymen
- 1929 Duff, Henry Hay, 58 Murray Place, Stirling
- 1929 Goodwin, Alexander, Peathill Farm, Stirling
- 1929 Hallam, John, Willowbank, Throak, by Stirling
- 1929 Hardie, Captain W., Station Hotel, Stirling
- 1929 Henderson, James, Burnhead, Throak, by Stirling
- 1929 Jarvie, Robert, Walton Farm, Castlegary, by Bonnybridge
- 1929 Johnston, Robert, Roughlands, Falkirk
- 1929 King, James, jun., Old Keir, Bridge of Allan
- 1930 Kirkwood, Robert A., The Camelion Hotel, Falkirk
- 1929 Lockhart, David, Bonnywood, Bonnybridge
- 1929 M'Farlane, David, Mid Lecroft, Bridge of Allan
- 1929 MacGregor, Duncan A., Allanfauld, Kilsyth
- 1930 M'Laren, William Cairns (Robertson & M'Laren), 19 Lower Craigs, Stirling
- 1929 M'William, William, Stewiebank, Kippen
- 1930 Melklejohn, James, Craigard, Causewayhead, Stirling
- 1930 Monro, Major George N., Auchinbowie, Bannockburn
- 1929 Morton, William, Bensfield, Falkirk
- 1929 Morton, Mrs William, Bensfield, Falkirk
- 1929 Muirhead, Thomas, Newmarket, Bannockburn
- 1929 Paterson, Alexander D., South Flanders, Kippen
- 1929 Patterson, Winning Russell, Lennox Estates Office, Lennoxtown
- 1929 Reid, Gavin, East Gogar, Blairlogie, Stirling
- 1929 Risk, James, Culmore, Kippen
- 1929 Shanks, Miss, Broomhill Farm, Denny
- 1929 Steel, George, Mungall Farm, Falkirk
- 1929 Templeton, Walter, Headswood Farm, Denny
- 1929 Thomson, William, jun., Muirmailing Farm, by Denny
- 1929 Turnbull, James, Hallquarter, Stirling
- 1929 Waddell, James, Easter Jawcraig Farm, Falkirk
- 1929 Weir, William Reid, Pleanbank Farm, Plean, by Bannockburn

4.—EDINBURGH DIVISION

MID-LOTHIAN

- 1930 Amour, John E., 15 Buccleuch Place, Edinburgh
 1929 Bennett, Arthur G., 138 Constitution Street, Leith
 1930 Buscke, Lewis W. V., 27 Charlotte Street, Leith
 1929 Bruce, Lord Dean of Guild Edward, 45 York Place, Edinburgh
 1930 Drysdale, Miss M. M., 55 Colinton Road, Edinburgh
 1929 Duncan, H. V., 99 Constitution Street, Leith
 1930 Dundas, James D., Polton House, Lasswade
 1929 Ferguson, Miss M., Secretary, Central Council, S.W.R.I., 50 George Street, Edinburgh
 1930 Forsyth, George E., 8 Craighall Gardens, Leith
 1929 Frederick, Alwyn, 138 Constitution Street, Leith
 1930 Graham, William, Ravensneuk, Penicuik
 1929 Graham-Yool, Norman J., 138 Constitution Street, Leith
 1929 Henderson, James S., 11 Stirling Road, Edinburgh
 1929 Ingham, A. G., F.S.I., A.M.Inst.C.E., Chief Surveyor, Department of Agriculture for Scotland, York Buildings, Queen Street, Edinburgh
 1930 Kerr, George, 67 Ashley Terrace, Edinburgh
 1930 Kerr, M. G. S., 2 Elmfield Park, Dalkeith
 1930 King, John Sidney, Department of Agriculture for Scotland, York Buildings, Queen Street, Edinburgh
 1929 Leckie, Robert Westlands, The Manse, Davidson's Mains
 1929 Macdonald, Donald Somerled, W.S., 1 Hill Street, Edinburgh
 1929 Mann, Alexander K., 138 Constitution Street, Leith
 1929 Matthew, Patrick Millar, 7 Ravelston Park, Edinburgh

- 1930 Parker, J. H., 20 Wardie Crescent, Edinburgh
 1929 Scott, Alexander, Crossgatehall, Dalkeith
 1930 Scott, Walter, M.R.C.V.S., D.V.S.M., Public Health Chambers, Johnston Terrace, Edinburgh
 1930 Smellie, —, Auchencorth, Penicuik
 1930 Somerville, John L., C.A., 37 Melville Street, Edinburgh
 1929 Sutherland, Alfred James (R. & W. Paul, Ltd.), 34 St Andrew Square, Edinburgh (99 Lothian Road, Edinburgh)
 1930 Waterston, James Sime, 85 George Street, Edinburgh
 1929 White, David, 138 Constitution Street, Leith

EAST LOTHIAN

- 1929 Clapperton, George, Garvald Mains, Haddington
 1930 Hutchison, George Henderson, Broad-bury, Gullane
 1929 Peel, Lieut.-Colonel Willoughby E., D.S.O., of Eaglescarnie, Haddington
 1930 Wallace, William, Monkkrigg Mains, Haddington

WEST LOTHIAN

- 1930 Boyd, William Hastie, Mount Stuart, Boness
 1930 Ford, Alexander, M.R.C.V.S., St Magdalenes, Linlithgow
 1930 Kirkwood, George, East Kerse Mains, Boness
 1929 Stewart, Abraham, Houston Mains, Uphall
 1929 Wilson, Stewart N., Powflats, Broxburn
 1930 Young, Allan T., West Craigie, Cramond Bridge

5.—ABERDEEN DIVISION

ABERDEEN

- 1930 Beaton, James, 256 Union Street, Aberdeen
 1930 Benzie, Robert, Chapelton, Ellon
 1929 Davidson, Walter Ramsay, Dess House, Dess Station
 1930 Innes, James (Garvie, Innes & Scott), 41 Willowdale Place, Aberdeen
 1930 Mair, John, Hillhead, Phingask, Fraserburgh
 1930 Milne, Garland C., Inverebrie Mains, Ellon
 1930 Ross, James G., Royal Athenaeum, Ltd., Union Street, Aberdeen
 1929 Watson, Miss E. M., N.D.D., South Monecht, Ecbt

BANFF

- 1929 Anderson, James, V.S., Craigisla, Keith
 1929 Grant, John, Home Farm, Aberlour, Banffshire

- 1930 Kitchin, A. W. Menzies, M.A., B.Sc., Clune, Cullen
 1929 Macdonald, Alexander V., 2 The Square, Portsoy
 1930 Mackenzie, Matthew, B.Sc., The Orphanage, Aberlour

ANGUS

(EASTERN DISTRICT)

- 1929 Borthwick, J. Henry S., Balloch, Montrose
 1929 Marshall, John, The Farmers' Mart, Ltd., Clerk Street, Brechin

KINCARDINE

- 1929 Christie, Alexander, Westside, Maryculter
 1929 Russell, Mrs M. P. L., The Burn, Edzell (Kincardineshire)

6.—DUMFRIES DIVISION

DUMFRIES

- 1930 Bell-Irving, Miss, Bankside, Lockerbie
 1929 Bell-Irving, Mrs, Whitehill, Lockerbie
 1930 Boyd, William John, Newmans, Kirkmahoe
 1930 Buckle, G., The Stables, Castlemilk, Lockerbie
 1930 Cartner, J. Irving, Clerkhill, Langholm
 1930 Dalglish, Miss Jane H., Brandleys, Sanquhar
 1930 Donaldson, James, Sarkshields, Eaglesfield, Lockerbie
 1930 Donaldson, John Morton, Torrorie, Preston, Dumfries
 1930 Duncan, Arthur Bryce, of Gilchristland, Closeburn, Dumfries
 1929 Ferguson, Mrs Janet, Burrance of Courance, by Lockerbie
 1930 Gaskell, Mrs F. H., Auchenbrack, Tynron, Thornhill
 1930 Gourlay, Mrs Effie Grace, Kirkland, Tynron, Thornhill
 1930 Graham, Christopher Edward, Bogrie, Canonbie
 1930 Greaves, John R., Nithbank, Thornhill
 1930 Hunter, William, Halleaths Home Farm, Lochmaben
 1930 Kelly, Miss H. B., Muirhead, Lockerbie
 1930 Kennedy, Thomas W., of Blackwood, Auldgirth
 1930 Kennedy-Moffat, T. W., Auchencheyne, Moniaive, Dumfries
 1930 Kerr, William Archibald, Todhillmuir, Lockerbie
 1930 Laurie, Robert Graham, Hollyhurst, Dumfries
 1930 Lightbody, Thomas, Beechwood, Greta
 1930 MacMillan, Mrs Alice J., Woodlea, Moniaive
 1930 MacMillan, Miss Betrag I. G., Woodlea, Moniaive
 1930 MacMillan, John G., Woodlea, Moniaive
 1930 Orr, David Roy, Polmoodie, Moffat
 1929 Ralston, Mrs Helen Ripley, Dabton, Thornhill
 1930 Thomson, W. A., Dalpeddar, Sanquhar

- 1930 White, John, sen., Balstack Farm, Lockerbie
 1930 White, John, jun., Balstack Farm, Lockerbie

KIRKCUDBRIGHT

- 1940 Black, James, Knockwalloch, Kirkpatrick-Durham, Dalbeattie
 1929 Carter, James Robertson, Mark, Twynholm
 1930 Dunlop, Robert, Chapelhill, Rerrick, Castle-Douglas
 1930 Gardiner, Thomas H., Upper Busko, Gatehouse-of-Fleet
 1930 Grierson, Mrs, Stokerton, Kirkcudbright
 1930 Haugh, James, 8 Victoria Park, Kirkcudbright
 1929 Kennedy, John, Barbush, Troqueer, Dumfries (Kirkcudbright)
 1929 M'Queen, James William Douglas, Crofts, Dalbeattie
 1930 Montgomery, Mrs Fanny, North Milton, Kirkcudbright
 1930 Murray-Usher, Mrs, of Cally, Gatehouse-of-Fleet
 1930 Taylor, H. C. Howard, Park House, Kirkcudbright
 1930 Weddell, Robert H., West Clouden, Dumfries (Kirkcudbright)
 1930 Welsh, William, Barholm, Gatehouse-of-Fleet

WIGTOWN

- 1930 Dalrymple, John M'Credie, Auchtralure, Stranraer
 1930 Hogarth, Robert, Estates Office, Rephad, Stranraer
 1929 M'Dowall, David, Glenhowl, Glenluce
 1930 M'Harrie, James, George Street, Stranraer
 1929 M'Master, M. W. A., Culgroat, Stoneykirk
 1930 M'Nally, George C., Park View, Stoneykirk

7.—INVERNESS DIVISION

CAITHNESS

- 1929 Grant, Alexander, South Road, Wick
 1929 Oag, William, Clatequoy, Thurso

INVERNESS

- 1929 Begg, G. W., M.R.C.V.S., Inverness
 1930 Buchan, Alexander, Invergarry Hotel, Invergarry

MORAY

- 1930 Ross, James A., St Leonard's Works, Forres

NAIRN

- 1930 Pottle, Peter M'Aulay Roberts, Achareidh Farm, Nairn
 1929 Taylor, Robert, Fornightly, Nairn

ORKNEY AND SHETLAND

(ORKNEY)

- 1930 Johnston, James H., Trumland Farm, Rousay, Orkney
 1929 Rutherford, John Simpson, Union Bank House, Kirkwall

ROSS AND CROMARTY

- 1930 Elford, Miss Lillian, Rosehaugh, Avoch
 1930 Mackenzie, D. J., Alexandra House, Invergordon

SUTHERLAND

- 1929 CHAPLIN, The Viscount, Uppat House, Brora (9 Hill Street, Berkeley Square, London, W. 1)

8.—BORDER DIVISION**BERWICK**

- 1929 Gourlay, Thomas A., Road Surveyor,
Chirnside
1930 Hood, James, jun., Linhead, Cockburns-
path
1929 Mitchell, Andrew, Neuk, Cockburns-
path
1930 Stevenson, Robert Lawson, 7 Murray
Street, Duns

PEEBLES

- 1930 Clarkson, Miss C. S., Skirling Mill,
Biggar

- 1929 Jennings, Sydney, Cardon, Broughton
1930 Noble, John C., Loanfoot, Skirling,
Biggar

ROXBURGH

- 1929 Paton, Mrs Arthur, Whitehill, St
Boswells
1930 Phaup, James, Dykes, Denholm
1929 Scott, John, Tudhope, Jedburgh

SELKIRK

- 1929 Hendrie, John, The Yair, Galashiels

ENGLAND AND WALES

- 1929 Allan, Charles E., Baynards Park, Cran-
leigh, Surrey
1929 Barker, W. G., Tancred Grange, Seorton,
Durham
1930 Carter, Sidney, Reliance Works,
Billingshurst, Sussex
1930 Forrester, Charles S., Skitby, Kirk-
lington, Carlisle
1929 Jones, Edward Llewelyn (Martin's Cul-
ticator Co., Ltd.), Stamford, Lincs.
1929 Neathercoat, Ernest Tom, C.B.E., J.P.
(Arnold & Son*), Gower House, St
George's Hill, Weybridge

- 1930 Paterson, John M., 6 Grove Road,
Strood, Kent
1929 Price, J. W. (Makbar, Ltd.), Pryme
Street Mills, Chester Road, Man-
chester
1929 Setten, H. A. (Mappin & Webb, Ltd.),
156-162 Oxford Street, London, W.1
1929 Sillars, A., M.R.C.V.S., Hopedene,
Denham Road, Epsom
1929 Vickers, Thomas Lloyd (Thomas Vickers
& Sons, Ltd.), Phosphate Works,
Widnes, Lincs. ("Trolpass," Elvan-
foot, Lanarkshire)

FOREIGN COUNTRIES

- 1929 Younger, George, Cleveland, U.S.A.

Highland and Agricultural Society of Scotland

INDEX

TO

THE FIFTH SERIES

OF

THE SOCIETY'S TRANSACTIONS

(VOLUMES XXXVI. TO XLII. INCLUSIVE)

FROM 1924 TO 1930

IN TWO PARTS

I. INDEX OF AUTHORS' NAMES

II. INDEX OF SUBJECTS AND PLACES

EDINBURGH:

WM. BLACKWOOD & SONS LTD., 45 GEORGE STREET
AND 37 PATERNOSTER ROW, LONDON

1930

INDEX OF AUTHORS.

B		Vol.	Page
BRADLEY, Principal O. CHABNOCK, M.D., D.Sc., M.R.C.V.S.			
The Dentition of the Pig		XLII.	51
BRUCE, WILLIAM, M.A., B.Sc.			
Sugar Beet Cultivation		XL.	92
C			
CALDER, ALEXANDER, Ph.D., B.Sc.			
Commercial Pig Production in Scotland. (Lessons from the Scottish Bacon Pig Competitions.)		XLII.	118
CREW, F. A. E., M.D., D.Sc., Ph.D., F.R.S.E.			
Genetics in Relation to Livestock Breeding		XXXVII.	146
CRICHTON, ARTHUR, M.A., B.Sc., and J. B. ORR, D.S.O., M.C., M.A., M.D., D.Sc.			
Review of Recent work on the Nutrition of the Pig		XXXIX.	25
CRICHTON, ARTHUR, M.A., B.Sc., and others.			
The Influence on Nutrition of Sunlight and Artificially Produced Ultra-violet Rays		XXXVIII.	88
CRICHTON, J., M.A., B.Sc.			
Rainfall Records for 1929, in inches		XLII.	246
The Weather in Scotland in 1929		XLII.	237
CRUICKSHANK, JAMES.			
Clay Farming and Ensilage		XXXVII.	23
D			
DAWE, C. V., M.Com., and ARTHUR G. RUSTON, B.A., B.Sc.(Lon.), D.Sc.(Leeds).			
Fourteen Years' Successful Poultry Farming		XL.	70
G			
GAIGER, Professor S. H., F.R.C.V.S.			
Braxy		XXXVIII.	1
GILLIES, JOHN, N.D.A., N.D.D.			
Manuring of Crops in Dumfries and Galloway		XLII.	152
GOLDIE, A. H. R., M.A., F.R.S.E.			
Rainfall Records for 1928 in inches		XL.	256
The Weather in Scotland in 1928		XL.	249
GREIG, Professor J. RUSSELL.			
Milk Fever		XLI.	115

H		Vol.	Page
HENDERSON, J. M., M.A., M.B., D.Sc., and others.			
The Influence on Nutrition of Sunlight and Artificially Produced Ultra-violet Rays		XXXVIII.	98
HENDERSON, T. G.			
Agricultural Co-operation in Scotland		XLI.	71
HENDRICK, Professor JAMES, B.Sc., F.I.C.			
Artificial Drying of Crops in the Stack		XXXVI.	141
Some Characters of Scottish Soils		XXXVII.	71
Some Points about Soil Fertility. (Illustrated from Craibstone Experiments.)		XXXVIII.	195
The Evolution of the Fertiliser Industry		XXXIX.	79
Patrick Bell and the Centenary of the Reaping Machine		XL.	51
A Soil Balance-sheet for a Rotation. (Results obtained from the Craibstone Drain Gauges.)		XLII.	1
HOME, J. H. MILNE, F.H.A.S.			
Rating and Taxing of Agricultural Subjects in Scotland		XXXVII.	93
The Utilisation and Conversion of Timber from the Point of View of the Small Landowner		XL.	23
K			
KINROSS, Miss AGNES, N.D.D.			
Poultry on the Farm		XXXVIII.	120
L			
LOW, WILLIAM.			
Notes on Intensive Cultivation of Grassland		XLII.	113
M			
M'CALL, Professor JOHN R., M.R.C.V.S., F.R.S.M.			
Navel Ill or Joint Evil in Foals (with special reference to its predisposing causes)		XXXVI.	84
M'CANDLEISH, ANDREW C., Ph.D., M.S.A., B.Sc.(Agric.), N.D.A., N.D.D.			
Feeding for Milk Production		XXXVIII.	55
The Cow and the Chemist		XXXIX.	42
MACDOUGALL, R. STEWART, M.A., D.Sc., F.R.S.E., Consulting Entomologist to the Society.			
Insect and other Pests of 1923		XXXVI.	100
Insect Pests of 1924		XXXVII.	167
Insect and other Invertebrate Pests of 1925		XXXVIII.	151
Insect and other Animal Enemies of 1926		XXXIX.	131
Insect and other Invertebrate Pests of 1927		XL.	116
Insect Enemies of 1928		XLI.	137
The Warble Flies of Cattle		XLII.	75
MACKINTOSH, JAMES, O.B.E., N.D.A., F.A.C.(Glas.).			
Circumstances Influencing the Yield and Quality of Milk		XXXVII.	126
O			
ORR, J. B., D.S.O., M.C., M.A., M.D., D.Sc.			
The Chemical and Physiological Properties of Milk, and their bearing on Problems of the Dairy Industry		XXXVI.	40
The Relation of the Chemical Composition of Pasture to its Feeding Value		XLI.	99
The Influence of Diet on Susceptibility to Disease		XLII.	28
ORR, J. B., D.S.O., M.C., M.A., M.D., D.Sc., and ARTHUR CRICHTON, M.A., B.Sc.			
Review of Recent Work on the Nutrition of the Pig		XXXIX.	25

	Vol.	Page
ORE, J. B., D.S.O., M.C., M.A., M.D., D.Sc., and others.		
The Influence on Nutrition of Sunlight and Artificially Produced Ultra-violet Rays	XXXVIII.	88

P

PATERSON, Principal W. G. R., B.Sc., N.D.A.(Hons.).		
Pig feeding and Cattle feeding Experiments	XXXVI.	161
Pig feeding (Indoor <i>versus</i> Outdoor Fattening)	XXXVII.	86
Winter Forage Crops and their Place in a Scheme of Crop- ping	XXXVIII.	106
Feeding <i>versus</i> Manuring for Beef Production during the Grazing Season	XXXIX.	60
Some Hay and Pasture Experiments	XL.	40
Cattle Feeding. (Report on experiments comparing heavy Root, medium Root, and no Root rations.)	XLII.	37
POOL, W. A.		
'Lamb Dysentery'	XLII.	47

R

RABAGLIATI, D. S., O.B.E., B.Sc., F.R.C.V.S., D.V.S.M.		
Diseases Common to Man and Animals	XXXIX.	97
ROBSON, JOHN, Jun.		
Cheviot Sheep, South and North Country	XLII.	63
RUSTON, ARTHUR G., B.A., B.Sc.(Lond.), D.Sc.(Leeds).		
Small Holdings	XXXVIII.	28
RUSTON, ARTHUR G., B.A., B.Sc.(Lond.), D.Sc.(Leeds), and C. V. DAWE, M.Com.		
Fourteen Years' Successful Poultry Farming	XL.	70

S

STEPHENS, THEO. A.		
Pig Problems	XXXIX.	74
STEVENSON, WILLIAM, B.Sc., N.D.A., N.D.D.		
Milk Records, 1923	XXXVI.	185
Milk Records, 1924	XXXVII.	194
Milk Records, 1925	XXXVIII.	216
Milk Records, 1926	XXXIX.	166
Milk Records, 1927	XL.	165
Milk Records, 1928	XLI.	196
Milk Records, 1929	XLII.	187
STOCKMAN, Sir STEWART, M.R.C.V.S		
Louping-ill	XXXVI.	1
Sheep Scab	XXXVII.	1

T

THOMPSON, J. K., N.D.A.		
Potatoes in Stook Feeding	XLII.	128
TOCHER, Dr J. F., Consulting Chemist to the Society.		
Grass Sickness in Horses	XXXVI.	65
Analyses for Members during 1923	XXXVI.	205
Analyses for Members during 1924	XXXVII.	216
Analyses for Members during 1925	XXXVIII.	238
Analyses for Members during 1926	XXXIX.	191
Analyses for Members during 1927	XL.	189
Analyses for Members during 1928	XLI.	221
Analyses for Members during 1929	XLII.	211

W

	Vol.	Page
WATSON, Professor J. A. SCOTT, B.Sc.		
Some Grass Land Problems . . . . .	. XXXVI.	25
The Choice of Varieties and Stocks of Crop Plants . . . . .	. XXXVII.	55
Baby Beef Production . . . . .	. XXXVIII.	76
Feeding Standards . . . . .	. XL.	1
The Agricultural Revolution in Scotland, 1750-1810 . . . . .	. XLI.	1
WATT, ANDREW, M.A., F.R.S.E.		
Rainfall Records for 1923 in inches . . . . .	. XXXVI.	246
Rainfall Records for 1924 in inches . . . . .	. XXXVII.	263
Rainfall Records for 1925 in inches . . . . .	. XXXVIII.	283
Rainfall Records for 1926 in inches . . . . .	. XXXIX.	233
Rainfall Records for 1927 in inches . . . . .	. XL.	237
The Weather in Scotland in 1923 . . . . .	. XXXVI.	238
The Weather in Scotland in 1924 . . . . .	. XXXVII.	254
The Weather in Scotland in 1925 . . . . .	. XXXVIII.	275
The Weather in Scotland in 1926 . . . . .	. XXXIX.	224
The Weather in Scotland in 1927 . . . . .	. XL.	228
WYLLIE, JAMES, B.Sc., N.D.A.(Hons.), N.D.D.		
Scientific Farm Management . . . . .	. XXXVII.	104
Some Popular Fallacies in Farming Economics . . . . .	. XXXIX.	1
Some Problems in Farm Management . . . . .	. XLI.	21

INDEX OF SUBJECTS AND PLACES.

A

	Vol.	Page
ABERDEEN and Temair, Marquess of, K.T., invited to accept office of President	XL.	413
ABERDEEN Show, 1928—		
Aberdeen Asylum for the Blind—Grant of free stand	XL.	415
Aberdeen Joint Hospitals Scheme—Application for free stand not granted	XLI.	406
Aberdeen, Marquess and Marchioness of, special prizes offered by	XL.	406, 409
Aberdeen Royal Mental Hospital—Grant of free stand	XL.	415
Abstract of accounts	XLI.	400
Alcoholic drinks—Report of observations during Show	XLI.	416, 421
Alterations in Prize List	XLI.	390
Attendants for goats, better accommodation for	XL.	406
Attending members appointed	XLI.	405, 409; list of, 391
Awards, List of	XLI.	309
Ayrshire cows, alteration to shedding for	XL.	406
Bacon Pig Competition—Grant of £25 and free stand	XL.	415
Band arrangements	XL.	404
British Friesian cows, alteration to shedding for	XL.	406
Caterers appointed	XL.	415
Catering Committee appointed	XL.	403
Convener of Local Committee appointed	XL.	406
Credit balance reported	XLI.	416
Date fixed	XL.	403
Draught geldings, larger boxes for	XL.	406
Draught geldings in harness—Class for geldings got by Clydesdale stallions	XL.	412
Forage contract	XL.	412
Forage Sub-Committee	XL.	403
Forestry Exhibition—Grant of £40	XL.	404
Free stands	XL.	412
General arrangements	XLI.	412
Goats, numbers on pens	XL.	406
Home-fed meat to be supplied at Show	XL.	415
Horse-shoeing Competition—Judges and attending members	XL.	412, 415
Hotel arrangements	XL.	403
Imperial farmers' tour—Visit to Show	XLI.	411
Judges appointed	XL.	406; list of, 390
Judges Selection Committee	XL.	403
Lady members' pavilion—To be used by lady members only	XL.	412; additional tickets for, 412.
Live-stock Judging Competition—Regulations revised	XL.	412
Local Committee appointed	XLI.	406
Meteorological demonstration	XL.	415
Milk yield certificates—New rule	XL.	406
New implement award	XLI.	404
New implement judges	XL.	413
Police arrangements	XL.	404
Prize List	XL.	406
Prize List and Regulations	XL.	(Appendix) 73
Proof of Prize List submitted	XL.	415
Rabbit judge	XL.	415
Report of	XLI.	279
Reports to General Meetings (Jan. 1926) XXXVIII. 459; (June 1926) XXXIX. 423; (Jan. 1927) 427; (June 1927) XL. 418; (Jan. 1928) 423; (June 1928) XLI. 436; (July 1928) 438; (Jan. 1929) 443.		

	Vol.	Page
ABERDEEN Show—continued.		
Royal Northern Agricultural Society—Requests privileges for members of	XL. 404; not granted	406
Rural industries, classes for	XL. 412; judges appointed	412, 415
Sheep classes, President's medals for		XL. 409, 412
Shetland ponies—Class for geldings		XL. 409
Shire horses, classes for		XL. 408, 411
Show Contracts Committee		XL. 404
Show-ground—Use of fair ground granted		XL. 409
Shropshire sheep—Alteration to classes		XL. 409
Single judging, request to discontinue		XLI. 441
Site fixed		XXXIX. 413
Sites Committee		XXXVIII. 452
Special prizes	XL. 404, 406, 409, 413,	415
State of show-ground		XLI. 411
Stewards appointed		XL. 408
Stock entries—New rule regarding number of entries and exhibitors		XL. 406
Timber contract		XL. 412
Timber—Question of supply of home timber		XXXIX. 417
Veterinary inspector appointed		XL. 408
Votes of thanks		XLI. 439
Wool section, additional classes for		XL. 412
See also "Show of 1928."		
ACCOUNTS of the Society, abstract of the 1922-23, XXXVI. 365; 1923-24, XXXVII. 386; 1924-25, XXXVIII. 418; 1925-26, XXXIX. 390; 1926-27, XL. 384; 1927-28, XLI. 396; 1928-29, XLII. 392.		
Statement by Mr Falconer L. Wallace regarding		XXXVI. 400
Question regarding outstanding Show Accounts		XXXVII. 422
ACT, Fertiliser and Feeding Stuffs, 1906. See "Fertiliser."		
ACTS, 1908, Poison and Pharmacy. See "Poisons."		
AFRIKANDER Cattle Breeders Society Herd-book, Society concurs as to recognition of		
		XL. 404
AGES of cattle—Request for dentition test XXXVIII. 444; no action taken, 448		
AGES of pigs. See "Dentition."		
AGRICULTURAL Advisory Committee, Mr W. P. Gilmour appointed on		
		XXXVIII. 446, 447
AGRICULTURAL colleges—Representatives appointed. See Appendix to each volume, pages 11 and 12.		
AGRICULTURAL co-operation in Scotland, by T. G. Henderson		
		XLI. 71
AGRICULTURAL Co-operative Societies, loans to		
		XXXVII. 397
AGRICULTURAL Credits (Scotland) Bill—		
Copy submitted		XLI. 412
Copy to be submitted to law agents		XLI. 423
Report by law agents		XLI. 425
AGRICULTURAL depression—		
Letter from East Lothian Branch of National Farmers' Union		XLII. 420
Report of Finance and Law Committee		XLII. 422
Society to call a joint meeting of representatives of agricultural bodies		
		XLII. 423
Chairman's report on proceedings at joint meeting		XLII. 426
Representatives appointed to attend further joint meeting		XLII. 426
Resolutions passed at various mass meetings		XLII. 426
AGRICULTURAL education—Power to grant diplomas. See Appendix attached to each volume. See also under "National Diplomas in Agriculture" and "Dairying," and under "Forestry."		
AGRICULTURAL education and research, Departmental Committee on, representatives appointed to give evidence before		
		XXXVI. 394; report of evidence given, XXXVII 398
AGRICULTURAL policy, conference on—Representatives appointed XXXVII. 405-6		

	Vol.	Page
AGRICULTURAL research in Scotland—A brief summary of the work at the Scottish agricultural research stations (1927) XLI. 146; (1928) XLI. 178; (1929) XLII. 169.		
AGRICULTURAL revolution in Scotland, 1750-1810, by Professor J. A. Scott Watson	XLII.	1
AGRICULTURAL statistics, compiled from Government returns	XXXVI.	247;
XXXVII. 264; XXXVIII. 284; XXXIX. 234; XL. 238; XLI. 257; XLII. 247.		
AGRICULTURAL subjects in Scotland, rating and taxation of, by J. H. Milne Home, F.H.A.S.	XXXVII.	93
AGRICULTURE, International Institute of, Rome—		
International conference of wheat experts	XL.	393
Master of Polwarth appointed as representative to a joint conference	XXXVIII. 451; report of, XXXIX. 401	
Representative on permanent international commission of agricultural associations requested	XXXIX. 410; Colonel F. J. Carruthers appointed, 414; agrees to attend first meeting at Rome, XL. 405; report of meeting, 407.	
Society in favour of Institute entering into relations with independent agricultural associations	XXXVIII.	429
ALEXANDRA, H.M. Queen—		
Address on death of	XXXVIII.	440
Thanks of H.M. The King for address	XXXVIII.	444
ALLOA Show, 1929—		
Abstract of accounts	XLII.	396
Alcoholic drinks, report on	XLI. 416; report of Special Committee, XLII. 402; list of, 388	
Attending members appointed	XLII. 402; list of, 388	
Awards, List of	XLII.	299
Ayrshire cattle—Alteration to class for heifers	XLI.	420
Bacon Pig Competition	XLI.	434
Caterers appointed	XLII.	402
Catering Sub-Committee	XLI.	416
Convener of Local Committee	XLI.	421
Cows from Grade A. (T.T.) or certified herds, special prizes and regulations for	XLI. 411, 420	
Date fixed	XLI.	416
Draught geldings in harness, class for	XLI.	420
Dunblane Agricultural Society complaint regarding another Society in Stirling District holding a Show	XLII.	408
Fat cattle—Rule 30 to be retained	XLI.	420
Forage Committee	XLI.	416
Forage contract	XLI.	428
Forestry exhibition—Grant of £40	XLI.	416
Free stands	XLI.	427
General arrangements	XLII.	408
Goats—Milking Competitions	XLI.	425
Grade A. (T.T.) or certified herds, special prizes and regulations for cows from	XLI. 411, 420	
Grand stand—Reduced charges	XLI.	425
Grand stand—Standing gallery extended to both ends, and both ends to be free	XLII.	402
Half-bred sheep—Alteration to class	XLI.	420
Horse-shoeing Competition—Judges and committee	XLI. 425, 427	
Hotel and Catering Committee	XLI.	416
Hunters—Saddle classes	XLI.	420
Judges appointed	XLI. 421; list of, XLII. 387	
Judges Selection Committee	XLI.	416
Large white Ulster pigs, classes for	XLI.	420
Licensed stands, extra buffet to	XLII.	402
Live stock Judging Competition, stock for entries, 428.	XLI. 421; closing date for	
Local Committee appointed	XLII.	402

	Vol.	Page
ALLOA Show—continued.		
Meeting of members in Showyard	*XLII.	430
New implement judges	XLI.	428
No protests	XLII.	409
Pig and pig products—Free site given to Ministry of Agriculture	XLI.	434
Prize List and Regulations	XLI. 416, 434 ;	Appendix 74
Probable loss reported	XLII.	411
Report of	XLII.	269
Report of Sites Committee	XLI.	406
Reports to General Meetings (June 1928) XLI. 436 ; (Jan. 1929) 443 ; (June 1929) XLII. 428 ; (July 1929) 430 ; (Jan. 1930) 433.		
Royal Dundee Institution for the Blind, free stand to	XLII.	402
Rule 30 to be retained	XLI.	420
St Dunstan's—Free stand	XLII.	408
Scottish Flying Club—Free space to	XLII.	408
S.S.P.C.A.—Free stand	XLI.	434
Scottish Women's Rural Institute, deputation from	XLI. 421 ;	special free stand, 427.
Shire horses—Protest regarding class for produce from stallions	XLI.	410
Show Contracts Committee	XLI.	416
Show-ground—Minute of agreement	XLI.	428
Single judging—Request to discontinue not granted	XLI.	417
Site fixed	XLI.	406
Stand rent refunded	XLII.	410
Stewards appointed	XLI.	425
Stewards of catering and stands	XLII.	402
Suffolk sheep—Auction in Show-ground	XLI.	425
Timber contract	XLI.	428
Timber—Suggestion that 75 per cent of home-grown timber be used	XLI.	428
Veterinary inspection of horses	XLI. 428, 434	
Veterinary inspector appointed	XLI.	425
Votes of thanks	XLII. 430-432	
See also "Show of 1929."		
ALLOTMENT Holders, Scottish National Union of—Society offer prizes for allotment gardens XXXIX. 414 ; XL. 395 ; conditions of, 397. See also Appendix.		
ANALYSES for members, by Dr J. F. Tocher (1923) XXXVI. 205 ; (1924) XXXVII. 216 ; (1925) XXXVIII. 238 ; (1926) XXXIX. 191 ; (1927) XL. 189 ; (1928) XLI. 221 ; (1929) XLII. 211.		
Privilege for members. See Appendix to each volume.		
Analyses of milk—Number of samples reduced	XXXVII.	410
Committee appointed to inquire into	XXXVIII.	432
Number of samples from any one member restricted	XXXVIII.	442
Privileges for veterinary surgeons amended	XXXVII.	410
Question raised at General Meeting regarding fertilisers and water supplies	XL.	419
ANIMAL Breeding Research Department, University of Edinburgh—		
Animal Breeding Committee set up	XLI. 410 ;	Hon. T. G. P. Corbett appointed representative on Committee, 410.
Application for grant towards endowment of Department of Research in Animal Breeding	XXXIX. 418 ;	grant of £1000, 420 ; confirmed, XL. 395, 418.
Grant for experimental work on breeding of pigs refused	XXXVIII.	431
Letter as to research in regard to sterility of stock	XXXVI. 386 ;	no action taken, 388.
ANIMAL Diseases Research Association, grants to—		
£200. (1926) XXXIX. 403 ; confirmed, 404, 422.		
£200. (1927) XL. 398 ; confirmed, 400, 418.		
£200. (1928) XLI. 409 ; confirmed, 412, 436.		
£200. (1929) XLII. 405 ; confirmed, 408, 428.		

	Vol.	Page
ANIMALS Act, 1925, Importation of Pedigree, with regard to—		
Afrikaner Cattle Breeders' Society Herd-book	XL.	404
Corriedale Sheep Flock-book of New Zealand	XXXVIII.	439
Duroc Jersey pigs—Record of Canadian Swine Breeders' Association	XL.	405
Friesland Herd-book of South Africa	XXXVIII.	439
Tamworth pigs—Record of Canadian Swine Breeders' Association	XXXIX.	402
ANIMALS , diseases common to man and, by D. S. Rabagliati, O.B.E., B.Sc., F.R.C.V.S., D.V.S.M.	XXXIX.	97
ARABLE land, acreage in each county of Scotland (1923) XXXVI. 247; (1924) XXXVII. 264; (1925) XXXVIII. 284; (1926) XXXIX. 234; (1927) XL. 238; (1928) XLI. 257; (1929) XLII. 247.		
ARGYLL Naval Fund—		
Abstract of the accounts (1923) XXXVI. 370; (1924) XXXVII. 392; (1925) XXXVIII. 424; (1926) XXXIX. 396; (1927) XL. 390; (1928) XLI. 402; (1929) XLII. 398.		
Beneficiaries of, appointed—		
Campbell, Walter John Rankine	XXXVI.	394
Dundas, James Hamilton	XLII.	420
Grieve, Kenneth Campbell	XLII.	420
Keys, Charles Edward	XXXIX.	402
M'Lean, Hector Charles Donald	XL.	400
Mellis, David Barclay Nairne	XLII.	420
Webster, Malcolm Wallace Graham	XXXVIII.	448
MacLachlan of MacLachlan appointed Convener of Committee	XXXVIII.	448
Reports to General Meeting (1924) XXXVI. 401; (1925) XXXVII. 422; (1926) XXXVIII. 457; (1927) XXXIX. 427; (1928) XL. 423; (1929) XLI. 443; (1930) XLII. 433.		
ARMOUR , Mr Harry, resolution on death of	XLI.	414
ARSENICAL sheep dips, resolution regarding inclusion of, under schedule to Pharmacy Act of 1908	XXXVIII.	431, 434
Report of conference with Board of Agriculture	XXXIX.	410
ARTICLES affecting agriculture, quantity and value of, imported into United Kingdom (1923) XXXVI. 254; (1924) XXXVII. 271; (1925) XXXVIII. 292; (1926) XXXIX. 242; (1927) XL. 246; (1928) XLI. 265; (1929) XLII. 255.		
ARTIFICIAL drying of crops in the stack, by Professor James Hendrick, B.Sc., F.I.C.	XXXVI.	141
ASSOCIATION for Preservation of Rural Scotland—		
Subscription of two guineas	XLI.	407
Mr Athole S. Hay appointed representative	XLI.	407
Submits copy of Rural Amenities Bill	XLII.	424
ATHOLL , the Duke of, K.T., C.B., M.V.O., D.S.O., elected President (1923-24)	XXXVI.	395
AUDITOR and Show treasurer—		
Death of Mr W. Home Cook, C.A.	XLI.	408
Mr George James Gregor, C.A., appointed	XLI.	412; accepts office, 415; fee increased, XLII. 414.
AUSTRALIA , direct shipment of Scottish pedigree stock to	XXXIX.	399, 401; XL. 393; XLI. 434.
AYRESHIRE Cattle Herd-book Society, congratulations to, on obtaining supreme championship at London Dairy Show	XXXVII.	403

B

BABY beef production, by Professor J. A. Scott Watson	XXXVIII.	76
BACON , home—		
Conference regarding supplies of	XXXIX.	405
Representatives appointed to attend conference	XXXIX.	405

	Vol.	Page
BALANCE-SHEET for a rotation, a soil, by Professor James Hendrick, B.Sc., F.I.C.	XLII.	1
BALFOUR, C. J., appointed officer and caretaker	XLI.	423
BARLEY, or ber3—		
Acreage in each county of Scotland (1923) XXXVI. 247; (1924) XXXVII. 264; (1925) XXXVIII. 284; (1926) XXXIX. 234; (1927) XL. 238; (1928) XLI. 257; (1929) XLII. 247.		
Price of home-grown, in the Edinburgh Market (1923) XXXVI. 259; (1924) XXXVII. 276; (1925) XXXVIII. 297; (1926) XXXIX. 247; (1927) XL. 251; (1928) XLI. 271; (1929) XLII. 261.		
Total produce, acreage, and average yield per acre in each county (1923) XXXVI. 248; (1923) XXXVII. 265; (1924) XXXVIII. 285; (1925) XXXIX. 235; (1926) XL. 239; (1927 and 1928) XLI. 258; (1929) XLII. 248.		
BARNES-GRAHAM, Mr Allan, forwarding copies of pamphlet on " Our Milk Supply "	XLII.	424
BEAN, Mr George, resolution on death of	XXXVIII.	450
BEANS—		
Acreage in each county of Scotland (1923) XXXVI. 247; (1924) XXXVII. 264; (1925) XXXVIII. 284; (1926) XXXIX. 234; (1927) XL. 238; (1928) XLI. 257; (1929) XLII. 247.		
Total produce, acreage, and average yield per acre in each county (1923) XXXVI. 249; (1923) XXXVII. 266; (1924) XXXVIII. 286; (1925) XXXIX. 236; (1926) XL. 240; (1927 and 1928) XLI. 260; (1929) XLII. 250.		
BEEF, &c., grading and marking of—		
Communication from Central Chamber of Agriculture	XLII.	416
Society to support scheme	XLII.	416
BEEF production, baby, by Professor J. H. Scott Watson	XXXVIII.	76
BEEF production during the grazing season, manuring <i>versus</i> feeding for, by Principal W. G. R. Paterson, B.Sc., N.D.A. (Hons.)	XXXIX.	60
BEEF cultivation, sugar, by William Bruce, M.A., B.Sc.	XL.	92
BELGIAN International Exhibition, 1925, date of	XXXVII.	402
BELL, Patrick, and the centenary of the reaping machine, by Professor James Hendrick, B.Sc., F.I.C.	XL.	51
Suggestion that Society appeal for funds for agricultural scholarship	XXXIX. 414; no action taken,	414
BILL, Agricultural Credits (Scotland)—		
Copy submitted	XLI.	412
Copy to be submitted to law agents	XLI.	423
Report by law agents	XLI.	425
BILL, Rural Amenities, submitted	XLII.	424
BILL, Transport—Society to support inclusion of clause regarding spark arresters	XLII.	420
BIRKETT, Mr William, B.Sc., presents to Society volume of Robert Maxwell's ' Practical Husbandry '	XXXVIII.	451
BLAKE, Mr J. J.—Salary increased	XXXIX. 412; XL.	410
BLYTHSWOOD, The Lord, K.C.V.O.—		
Elected President of the Society for year 1924-25	XXXVII.	416
Resolution on death of	XLII.	414
BOARD meeting—Date changed XXXVI. 390; XLII. 423; suggested change of hour, XLI. 410.		
BOARD meetings, proceedings at. See " Proceedings."		
BOARD, Potato Marketing. See " Potato."		

	Vol.	Page
BORDER Union Agricultural Society, grant of £350 by, for Kelloe Show, 1926	XXXVIII.	458 ; XXXIX. 425
BOTANICAL department—		
Scale of charges and instructions for selecting and sending samples will be found in the Appendix to each volume.		
Professor A. N. M'Alpine, botanist to the Society, death of	XXXVII.	408
BRAXY, by Professor S. H. Gaiger, F.R.C.V.S.	XXXVIII.	1
BREEDERS, Joint Committee of British Live Stock. See "Live Stock."		
BREEDING conference, cattle—		
Mr G. B. Shields appointed representative on Convening Committee	XXXVI.	392 ; agrees to attend first meeting only, 394 ; reports on proceedings at first meeting, XXXVII. 396.
Date of conference	XXXVII.	399
BREEDING, genetics in relation to live-stock, by F. A. E. Crew, M.D., D.Sc., Ph.D., &c.	XXXVII.	146
BRIDGE OF ALLAN, Show of 1929 not to be held at	XLI.	406
BRITISH and Danish agriculturists, exchange of	XXXVIII.	439
BRITISH Friesian Cattle Society—Letter regarding Order prohibiting the showing of tuberculin-tested cattle	XLII.	424
BRITISH Wool Federation—Letter regarding serious decline of wool production	XXXVII.	400
BROWN, Mr Andrew, caretaker, death of	XLI.	423
BROWN, Mr John, M.R.C.V.S., appointed veterinary inspector, for Perth Show, 1924	XXXVI.	387
BROWN, Mr William, M.R.C.V.S., appointed veterinary inspector for Aberdeen Show, 1928	XL.	408
BUCCLEUCH and Queensberry, The Duke of, K.T., elected President of the Society for the year 1929-30	XLII.	427
BUCHANAN-JARDINE, Sir Robert W., Bart., resolution on death of	XXXIX.	415
BUCHAN-HEPBURN, Sir Archibald, of Smeaton, Bart., resolution on death of	XLII.	407
BULLS, licensing of—		
Society to support representation by Joint Committee of Shorthorn Breeders	XL.	414
Legislative authority required for scheme	XLI.	405
Further representation to Ministry of Agriculture	XLII.	422
BUTTAR, Thomas A., appointed representative to attend joint meeting on warble fly pest	XXXVIII.	433
BUTTER, quantity and value of, imported into the United Kingdom (1923) XXXVI. 257 ; (1924) XXXVII. 274 ; (1925) XXXVIII. 295 ; (1926) XXXIX. 245 ; (1927) XL. 249 ; (1928) XLI. 269 ; (1929) XLII. 259.		
BYE-LAWS, model dairy—Directors unable to give any observations thereon within time specified	XXXVIII.	439
BYE-LAWS—Memorandum from law agents on revision of Society's	XLII.	417
CABBAGE—Acreage in each county of Scotland (1923) XXXVI. 247 ; (1924) XXXVII. 264 ; (1925) XXXVIII. 284 ; (1926) XXXIX. 234 ; (1927) XL. 238 ; (1928) XLI. 257 ; (1929) XLII. 247.		
CAMPBELL, Mr Ian M., nominated as an ordinary director in room of Lieut.-Colonel T. W. Cuthbert (resigned)	XLII.	415 ; accepts office, 418 ; elected, 433.

	Vol.	Page
CAMPBELL, Walter John Rankine, appointed to list of beneficiaries of Argyll Naval Fund	XXXVI.	394
CANADIAN Swine Breeders' Association records, Society concur as to recognition of	XXXIX.	402; XL. 405
CANVAS destroyed at Edinburgh Show, 1927— Grant of £250 to contractors	XL.	410
CARETAKER, officer and— Death of Mr Andrew Brown Mr C. J. Balfour appointed Mr James P. Lauder appointed	XLI. XLI. XLI. XLII.	423 423 409
CARRUTHERS, Colonel F. J., of Dormont— Attends conference regarding studs on traction engines and reports proceedings Appointed as representative on permanent International Commission of Agricultural Associations, Rome Attend first meeting at Rome, XL. 405; reports proceedings at, 407. Appointed on Leathersellers' Company's Warble Fly Committee Appointed Convener of Local Committee for Dumfries Show, 1930 Appointed to attend joint meeting regarding agricultural depression Elected chairman of the Board of Directors Nominated as Honorary Secretary	XXXVII. XXXIX. XL. XLII. XLII. XLII. XXXVIII. XXXIX. XLI.	407 414; agrees to 407. 410 412 426 436; re-elected, 407 420; elected, 442
CATTLE— Number of, in each county in Scotland (1923) (1924) (1925) (1926) (1927) (1928) (1929) Number of, imported into Great Britain from Ireland (1923) (1924) (1925) (1926) (1927) (1928) (1929) Number and value of, imported into the United Kingdom (1923) (1924) (1925) (1926) (1927) (1928) (1929)	XXXVI. XXXVII. XXXVIII. XXXIX. XL. XLI. XLII. XXXVI. XXXVII. XXXVIII. XXXIX. XL. XLI. XLII. XXXVI. XXXVII. XXXVIII. XXXIX. XL. XLI. XLII.	252; (1924) 269; (1925) 290; (1926) 240; (1927) 244; (1928) 264; (1929) 258; (1923) 258; (1924) 275; (1925) 296; (1926) 246; (1927) 250; (1928) 270; (1929) 260. 258; (1923) 275; (1924) 296; (1925) 246; (1926) 250; (1927) 270; (1928) 260; (1929)
CATTLE, ages of—Request for dentition test	XXXVIII.	444; no action taken, 448
CATTLE at auction marts, compulsory weighing of store— Letter from Morayshire Farmer Club remitted to Special Committee Additional members added to Committee Committee's recommendation to support Morayshire Farmer Club not adopted	XXXVII. XXXVII. XXXVII. XXXVII.	404 410 412
CATTLE breeding conference— Mr G. B. Shields appointed as representative on Convening Committee reports proceedings at meeting, Date of conference	XXXVI. XXXVII. XXXVII.	392; agrees to attend first meeting only, 394; 396. 399
CATTLE, commercial— Mr James M'Laren submits scheme for encouragement of breeding of good Scheme remitted to Special Committee Scheme postponed	XL. XL. XLI.	413 413 422
CATTLE feeding, by Principal W. G. R. Paterson, B.Sc., N.D.A. (Hons.)	XLII.	37
CATTLE feeding and pig feeding experiments, by Principal W. G. R. Paterson, B.Sc., N.D.A. (Hons.)	XXXVI.	161
CATTLE-TESTING station, Pirbright, closing of	XXXVI.	375, 388

	Vol.	Page
CATTLE, the warble flies of, by R. Stewart MacDougall, M.A., D.Sc., F.R.S.E.	XLII.	75
CATTLE—Tuberculin test for animals sent to the Argentine, sugges- tion regarding, not adopted	XXXVII.	405
CENTENARY of invention of reaping machine— Suggestion as to establishment of a "Dr Bell" agricultural scholarship	XXXIX.	414
Society not to issue appeal for funds	XXXIX.	414
CENTENARY of the reaping machine, Patrick Bell and the, by Professor James Hendrick, B.Sc., F.I.C.	XL.	51
CENTRAL Electricity Board— Mr G. S. Davidson, D.S.C., recommended as a member of proposed Board	XXXIX.	415
CEREAL and other crops of Scotland, and the weather in Scotland (1923) XXXVI. 212; (1924) XXXVII. 226; (1925) XXXVIII. 250; (1926) XXXIX. 202; (1927) XL. 202; (1928) XLI. 227; (1929) XLII. 217.		
CHAIRMEN of the Board of Directors— Mr J. T. M'Laren, The Leuchold, elected XXXVI. 381; re-elected, XXXVII. 402. Colonel F. J. Carruthers of Dormont elected XXXVIII. 436; re-elected, XXXIX. 407. Mr James M'Laren, Cornton, elected XL. 402; re-elected, XLI. 414 Mr J. E. Kerr of Harviestoun elected XLII. 410		
CHAMBER of Agriculture, Central—Communication regarding grad- ing and marking of beef, &c.	XLII.	416
CHAPELAIN to the Society— Congratulations to Very Rev. Dr Wallace Williamson on receiving Order of K.C.V.O. XXXVIII. 450 Death of Very Rev. Dr Wallace Williamson, K.C.V.O. XXXIX. 407 Very Rev. Charles Lang Warr, M.A., appointed XXXIX. 414; accepts office, 416; appointment confirmed, 426.		
CHARACTERS of Scottish soils, some, by Professor James Hendrick, B.Sc., F.I.C.	XXXVII.	71
CHEESE, quantity and value of, imported into United Kingdom (1923) XXXVI. 257; (1924) XXXVII. 274; (1925) XXXVIII. 295; (1926) XXXIX. 245; (1927) XL. 249; (1928) XLI. 269; (1929) XLII. 259.		
CHEMICAL and physiological properties of milk and their bearing on problems of the dairy industry, by J. B. Orr, D.S.O., M.C., M.A., M.D., D.Sc.	XXXVI.	40
CHEMICAL composition of pasture to its feeding value, the relation of the, by J. B. Orr, D.S.O., M.C., M.D., M.B., D.Sc.	XLI.	99
CHEMICAL Department— Analyses of milk—Number of samples in any one year reduced XXXVII. 410 Committee to inquire into analyses for members XXXVIII. 432 Number of samples for any one member reduced XXXVIII. 442 Question raised at General Meeting regarding fertilisers and water supplies XL. 419 Veterinary surgeons, amended conditions for privileges of analyses for XXXVII. 410 The conditions and regulations governing the Chemical De- partment will be found in the Appendix attached to each volume. See also "Science Department."		
CHEMIST, the cow and the, by Andrew C. M'Candlish, Ph.D., M.S.A., B.Sc.	XXXIX.	42
CHEVIOT sheep, south and north country, by John Robson, Jun.	XLII.	63

	Vol.	Page
CHIEF clerk—		
Death of Mr Edward M. Cowie	XXXVIII.	432, 455
Mr J. G. Yardley appointed	XXXVIII.	439
CHOICE of varieties and stocks of crop plants, by Professor J. A. Scott Watson, B.Sc.	XXXVII.	55
CIRCUIT of Shows—		
Committee appointed to go into question of	XXXIX.	409
Report of Committee	XXXIX.	412
Amendment thereto defeated	XXXIX.	412
CIRCUMSTANCES influencing the yield and quality of milk, by James Mackintosh, O.B.E., N.D.A., &c.	XXXVII.	126
CLARK, Mr William, of Netherlea, resolution on death of	XXXVI.	392
CLAY farming and ensilage, by James Cruickshank	XXXVII.	23
CLOVER, acreage in each county in Scotland (1923) XXXVI. 247; (1924) XXXVII. 264; (1925) XXXVIII. 284; (1926) XXXIX. 234; (1927) XL. 238; (1928) XLI. 257; (1929) XLII. 247.		
CLOVER and grasses—		
Total produce, acreage, and average yield per acre in each county of Scotland (1922) XXXVI. 251; (1923) XXXVII. 268; (1924) XXXVIII. 288; (1925) XXXIX. 238; (1926) XL. 242; (1927 and 1928) XLI. 262; (1929) XLII. 252.		
CLOVER seed, wild white—		
Letter from Ministry of Agriculture	XXXVIII.	451
Representatives appointed to a meeting to discuss formation of Growers Association	XXXIX.	401
Report of meeting	XXXIX.	404
Members invited to send samples to Board of Agriculture	XXXIX.	401
Growing tests to be available in 1927	XXXIX.	411
Investigation of samples	XL.	401
CLYDESDALE horse—		
Stallion rejected from Australia	XXXVII.	404
COLLEGES of agriculture—		
Society representatives. See Appendix to each volume.		
COLORADO beetle—Report by Dr R. Stewart MacDougall	XXXVI.	397
COMMERCIAL cattle—		
Mr James M'Laren submits scheme for encouragement of breeding of good	XL.	413
Scheme remitted to Special Committee	XL.	413
Scheme postponed	XLI.	422
COMMERCIAL pig production in Scotland, by Alexander Calder, Ph.D., B.Sc.	XLII.	118
COMMISSION of Agricultural Associations, permanent International, appointment of representative deferred XXXIX. 410; Colonel F. J. Carruthers appointed, 414; agrees to attend meeting at Rome, XL. 405; report of meeting, 407.		
See also International Institute of Agriculture.		
COMMITTEE on Land Settlement in Scotland—		
Representatives to give evidence before	XL.	401
COMMITTEES, standing. See Appendix to each volume, page 12.		
COMPENSATION values, tables for 1924 to 1930 inclusive. See Appendix to each volume.		
COMPULSORY weighing of store cattle at auction marts—		
Letter from Morayshire Farmer Club remitted to Special Committee	XXXVII.	404
Additional members added to Committee	XXXVII.	410
Committee's recommendation to support Morayshire Farmer Club not adopted	XXXVII.	412

	Vol.	Page
CONFERENCE, joint, on agricultural depression. See "Agricultural."		
CONFERENCE of representatives of Scottish milk producing and distributing interests—Representatives appointed . . .	XXXVI.	383
CONFERENCE on agricultural policy—Representatives appointed to attend . . .	XXXVII.	405
CONFERENCE on cattle breeding. "See Cattle."		
CONFERENCE, proposed grassland—		
Suggestion that Society convene a conference . . .	XL.	409
Recommended that subject be discussed by agricultural section of British Association . . .	XL. 409; XLI.	405
CONGRESS of entomology, international—		
Dr R. Stewart MacDougall to represent Society at Zurich . . .	XXXVIII.	433;
and at Cornell University, XL.	416.	
CONGRESS, proposed international dairy—		
Views of society invited regarding holding of preliminary conference . . .	XXXVII.	407
Mr John Speir to represent Society . . .	XXXVII.	408
Representatives appointed to attend special meeting . . .	XXXVII.	414
Report of special meeting . . .	XXXVIII.	420
Directors in favour of congress being proceeded with . . .	XXXVIII.	432
Holding of congress to be reconsidered . . .	XXXVIII.	439
Congress to be held . . .	XXXVIII.	440
Mr W. P. Gilmour to represent Society at a further meeting . . .	XXXVIII.	440
National Farmers' Union withdraws from Provisional Council . . .	XXXIX.	401
Further information to be obtained before giving financial support . . .	XXXIX.	405
Mr W. P. Gilmour appointed representative on Finance Committee . . .	XXXIX.	406
Mr W. P. Gilmour to represent Society at meeting regarding World's Dairy Congress . . .	XL.	393
Draft programme submitted . . .	XL.	413
Request for contribution . . .	XL.	413
Grant of twenty-five guineas . . .	XL.	416
Delegates appointed to attend congress . . .	XL.	416
CONGRESS, 11th International Veterinary—		
Representatives appointed to attend . . .	XLII.	413
CONJOINT Board of Scientific Societies dissolved . . .	XXXVI.	373
CONSTABLE, Mr George W., resolution on death of . . .	XL.	402
CONSULTING engineer—Salary increased . . .	XLII.	409
CONVERSION of timber, utilisation and, from the point of view of the small landowner, by J. H. Milne Home, F.H.A.S. . .	XL.	23
COOK, Mr W. Home, C.A., auditor, resolution on death of . .	XLI.	408
CO-OPERATION in Scotland, agricultural, by T. G. Henderson .	XLI.	71
CORBETT, Hon. T. G. P.—		
Appointed delegate to World's Dairy Congress . . .	XL.	416
Appointed representative on Animal Breeding Committee .	XLI.	410
CORN crops, acreage in each county of Scotland (1923) XXXVI. 247; (1924) XXXVII. 264; (1925) XXXVIII. 284; (1926) XXXIX. 234; (1927) XL. 238; (1928) XLI. 257; (1929) XLII. 247.		
CORN, quantity and value of, imported into United Kingdom (1923) XXXVI. 253; (1924) XXXVII. 270; (1925) XXXVIII. 291; (1926) XXXIX. 241; (1927) XL. 245; (1928) XLI. 265; (1929) XLII. 255.		
CORRIEDALE Sheep Flock-Book of New Zealand, Society concur as to recognition of . . .	XXXVIII.	439

	Vol.	Page
COTTAGES and gardens—		
Premiums awarded (1923) XXXVI. 361; (1924) XXXVII. 383; (1925) XXXVIII. 415; (1926) XXXIX. 387; (1927) XL. 361; (1928) XLI. 392; (1929) XLII. 389.		
Premiums offered (Appendix) (1924) XXXVI. 64; (1925) XXXVII. 64; (1926) XXXVIII. 76; (1927) XXXIX. 72; (1928) XL. 69; (1929) XLI. 69; (1930) XLII. 67.		
COUNCIL for Scotland, proposed national dairy. See "Dairy Council."		
COUNCIL, Wool Breeding. See "Wool."		
Cow and the chemist, the, by Andrew C. M'Candlish, Ph.D., M.S.A., B.Sc.	XXXIX.	42
COWIE, Mr Edward M., chief clerk—		
Resolution on death of	XXXVIII.	432
Death of, reported to General Meeting	XXXVIII.	455
COWIE, Mrs E. M., allowance to	XXXVIII.	439
Cows and heifers, number of each in each county in Scotland (1923) XXXVI. 252; (1924) XXXVII. 269; (1925) XXXVIII. 290; (1926) XXXIX. 240; (1927) XL. 244; (1928) XLI. 264; (1929) XLII. 254.		
Cows from Grade A. (T.T.) or certified herds, special prizes for	XLI.	411, 420
CREDITS (Scotland) Bill, Agricultural—		
Copy submitted	XLI.	412
Copy to be submitted to law agents	XLI.	423
Report by law agents	XLI.	425
CRIEFF, Show of 1929 not to be held at	XLI.	406
CROP plants, the choice of varieties and stocks of, by Professor J. A. Scott Watson, B.Sc.	XXXVII.	55
CROPS—		
Cereal and other, of Scotland, reports from counties in Scotland (1923) XXXVI. 212; (1924) XXXVII. 226; (1925) XXXVIII. 250; (1926) XXXIX. 202; (1927) XL. 202; (1928) XLI. 227; (1929) XLII. 217.		
Total acreage in each county of Scotland (1923) XXXVI. 247; (1924) XXXVII. 264; (1925) XXXVIII. 284; (1926) XXXIX. 234; (1927) XL. 238; (1928) XLI. 257; (1929) XLII. 247.		
CROPS in the stacks, artificial drying of, by Professor James Hendrick, B.Sc., F.I.C.	XXXVI.	141
irrig of, in N.D.A., N.D.D.	XLII.	152
CROPS, winter forage, and their place in a scheme of cropping, by Professor W. G. R. Paterson, B.Sc., N.D.A.(Hons.)	XXXVIII.	106
CULTIVATING harrow, new. See "Harrow."		
CULTIVATION of grassland, notes on intensive, by William Low	XLII.	113
CULTIVATION, sugar-beet, by William Bruce, M.A., B.Sc.	XL.	92
CUPS, Perpetual Gold Challenge—		
Suggestion that names of winners be engraved on	XXXIX.	416
Names to be engraved on plates attached to plinths	XXXIX.	419
CUTBERT, Lieut.-Colonel T. W., Achindunie—		
Tenders resignation from Board	XLII.	406
Requested to reconsider decision	XLII.	408
Resignation accepted	XLII.	408

D

DAIRY bye-laws, model, directors unable to give observations within time specified XXXVIII. 439

DAIRY Congress, International—

Views of Society invited regarding the holding of a preliminary conference XXXVII. 407
 Mr John Speir appointed as representative XXXVII. 408
 Representatives appointed to attend special meeting XXXVII. 414
 Report of special meeting XXXVIII. 429
 Directors in favour of congress being proceeded with XXXVIII. 432
 Question of holding congress to be reconsidered XXXVIII. 439
 Congress to be held XXXVIII. 440
 Mr W. P. Gilmour to represent Society at a further meeting XXXVIII. 440
 National Farmers' Union withdraws from Provisional Council XXXIX. 401
 Further information to be obtained before giving financial assistance XXXIX. 405
 Mr W. P. Gilmour appointed on Finance Committee XXXIX 406
 Mr W. P. Gilmour to represent Society at a meeting regarding World's Dairy Congress XL. 393
 Draft programme submitted XL. 413
 Request for contribution XL. 413
 Grant of twenty-five guineas XL. 416
 Delegates appointed to attend congress XL. 416

DAIRY Council for Scotland, proposed National—

Letter from Board of Agriculture remitted to Special Committee XXXVI. 391; report of Special Committee, 394
 Representatives appointed to attend a conference XXXVII. 397; report of conference, 400.
 Mr John Speir to represent Society on Provisional Council XXXVII. 404
 Representatives appointed to attend meeting in Glasgow XXXVII. 404

DAIRY department—

Butter. See "Butter."
 Diploma examination. See "National."
 Milk Records. See "Milk."

DAIRY industry, chemical and physiological properties of milk, and their bearing on problems of the, by J. B. Orr, D.S.O., M.C., M.A., M.D., D.Sc.

. XXXVI. 40

DAIRY Research Institute, the Hannah—

Application for grant for three years XLI. 415; refused, 421
 Application for grant for equipment and towards endowment fund XLII. 413; grant of £1500, 417; confirmed, 420, 433.

DAMAGE by deer—

Representatives appointed to attend conference XLI. 422
 Representatives appointed to attend a further conference XLII. 411, 422

DANISH and British agriculturists, exchange of XXXVIII. 439

DATE of Board meeting changed XXXVI. 390; XLII. 423

DAVIDSON, Mr Gilbert—

To represent Society at a conference regarding proposed Sheep (General Double Dipping) Order, 1925 XXXVIII. 448
 Resolution on death of XL. 402

DAVIDSON, Sir James Inglis—Appointed to attend meeting regarding railway freights XLI. 411

DEATHS—

H.M. Queen Alexandra XXXVIII. 440, 444
 Mr Harry Armour, Niddry Mains XLI. 414
 Mr George Bean, Montrose XXXVIII. 450
 Baron Blythswood of Blythswood XLII. 414
 Mr Andrew Brown (caretaker) XLI. 423
 Sir Robert W. Buchanan-Jardine of Castlemilk, Bart. XXXIX. 415
 Sir Archibald Buchan-Hepburn of Smeaton, Bart. XLII. 407

	Vol.	Page
DEATHS—continued.		
Mr William Clark of Netherlea	XXXVI.	392
Mr George W. Constable, Traquair	XL.	403
Mr W. Home Cook, C.A. (auditor)	XLI.	408
Mr Edward M. Cowie (chief clerk)	XXXVIII. 432.	455
Mr Gilbert Davidson, Hawick	XL.	402
Mr Robert Dickinson, Longcroft	XXXVI.	384
Mr William Donald of Fardalehill	XXXVIII.	447
Mr Charles Douglas, C.B., of Auchlochan (Hon. Secretary)	XXXVI.	389
Mr Thomas G. Duff of Drummair	XXXVI.	373
Sir Henry Dundas, Bart.	XLII.	424
Mr John Edmond of Gallamuir	XXXVI.	380
Mr William Elliot, Lanark	XLI.	433
Lt.-Col. G. J. Fergusson-Buchanan	XL.	419
Baron Forteviot of Dupplin	XLII.	415
Dr R. Shirra Gibb, Boon	XXXVI.	390
Mr Peter Grant, Advie Mains	XLII.	410
Mr James Gray, Glenoonah	XLII.	418
Mr James Grieve, Rumbletonlaw	XXXVIII.	435
Earl Haig	XL.	411
Sir John A. Hope, Bart.	XXXVII.	397
Mr James A. Hunter, Machriebeg	XXXVII.	435
Mr William J. Kippen of Westerton	XLI.	419
Mr Thomas Kirk of Abbeymains	XXXVII.	413
Mr Andrew B. Leitch of Inchstelly	XXXVII.	401
Professor A. N. M'Alpine (botanist)	XXXVII.	408
Mr John M'Caig of Belmont	XXXVIII.	435
Mr J. Huntly Macdonald, Torbreck	XXXIX.	407
Sir Kenneth J. Mackenzie of Gairloch, Bart.	XLII.	417
Mr Duncan M'Laren of Fairnington	XXXIX.	419
Mr John M. Martin	XXXVI.	380
The Duke of Montrose	XXXVIII.	444
Mr J. J. Moubray of Naemoor	XLI.	414
Mr Robert G. Murray, Spittal	XXXVII.	435
Mr A. B. Nicholson of Glenbervie	XXXVI.	393
Colonel John L. Reid of Cromley Bank	XL.	396
Mr William Reith, Kennerty	XLI.	408
The Duke of Richmond and Gordon, K.G.	XL.	411
Mr Alexander Robertson, Polmaise	XLII.	401
Mr James Rodger, Bridge of Allan	XLI.	424
The Earl of Rosebery, K.G., K.T.	XLII.	407
Brig.-Gen. Sir Walter Charteris Ross, K.B.E., C.B.	XL.	414
Mr E. Hedley Smith, Whittingehame	XXXVII.	402
Sir Mark J. M'Taggart Stewart	XXXVI.	380
Sir John Stewart-Clark of Dundas, Bart.	XXXVI.	393
Mr Robert C. Todd (second clerk)	XLI.	413
Mr Duncan M. Wallace, Glasgow	XL.	399
The Very Rev. Dr Wallace Williamson, K.C.V.O. (Chaplain)	XXXIX.	407
Mr Robert C. Young, Netherfield	XL.	414
Viscount Younger of Leckie	XLII.	405
DEER, damage by—		
Representatives appointed to attend conference	XLJ.	422
Representatives appointed to attend a further conference	XLII. 411, 422	
DEFICIENT samples, chemist's report on. See "Analyses" and "Science Department."		
DENTITION of the pig, by Principal O. Charnock Bradley, M.D., D.Sc., M.R.C.V.S.		
	XLII.	51
DENTITION of the pig—		
Dentition test at Shows not to be imposed	XXXIX. 411 ; XLII.	415
Request for grant towards investigation into the	XL.	404
Grant of £20	XL. 407, 422	
Interim report of investigation	XLI.	417
DENTITION test for cattle, request for, at Shows XXXVIII. 444 ; no action taken, 448.		

	Vol.	Page
DEPARTMENTAL Committee on Agricultural Education and Research, Sir David Wilson and Mr George Will to give evidence before	XXXVI	394
Report evidence given	XXXVII.	398
DEPRESSION, agricultural. See "Agricultural."		
DE-RATING scheme, memorandum regarding	XLI.	420
DEWAR, Hon. John (Lord Provost of Perth), appointed Convener of Local Committee for Perth Show, 1924	XXXVI.	385
DICKINSON, Mr Robert, resolution on death of	XXXVI.	384
DIET on susceptibility to disease, the influence of, by J. B. Orr, D.S.O., M.C., M.A., M.D., D.Sc.	XLII.	28
DIPLOMA holders as free life members. See end of official list of members.		
DIPS, arsenical sheep—		
Resolution as to inclusion of, under the schedule to the Pharmacy Act, 1908	XXXVIII.	431, 434
Report of conference with Board of Agriculture	XXXIX.	410
DIRECTORS—		
The Marquess of Aberdeen and Temair, K.T., elected President in room of the Duke of Richmond and Gordon (deceased)	XL.	413
Mr Ian M. Campbell, Dornoch, nominated as an ordinary director in room of Lieut.-Colonel T. W. Cuthbert (resigned) agrees to accept office, 418; elected, 433.	XLII.	415 ;
Colonel F. G. Carruthers of Dormont nominated as Honorary Secretary in room of Sir Hugh Shaw Stewart, Bart., C.B., resigned	XLI.	420; elected, 442
Lieut.-Colonel T. W. Cuthbert, letter from, resigning his position as a director	XLII.	406; requested to reconsider decision, 406; resignation of, accepted, 408.
Mr W. Bette Donaldson of Auchineden nominated as an extraordinary director in room of Mr W. J. Kippen (deceased)	XLI.	420; elected, 442
Mr J. Bryce Duncan of Newlands nominated as an ordinary director in room of Colonel F. J. Carruthers, appointed Hon. Secretary	XLII.	401; agrees to accept office, 405; elected, 428
Mr Peter Grant, Carr Bridge, nominated as a director in room of Mr Andrew B. Leitch (deceased)	XXXVII.	406; elected, 421
Mr J. E. Kerr of Harviestoun nominated as a Vice-President in room of Mr J. J. Moubray (deceased)	XLI.	420; elected, 442
Mr James M'Clean, Portpatrick, nominated as a director in room of Mr John M'Caig (deceased)	XXXVIII.	440; elected, 457
Mr Robert M'Gee, Blackfaulds, nominated as an extraordinary director in room of Mr J. E. Kerr, elected Vice-President	XLI.	420; elected, 442.
Dr Thomas G. Nasmyth nominated as a director in room of Sir John A. Hope, Bart. (deceased)	XXXVII.	406; elected, 421
General Sir Walter Charteris Ross of Cromarty tenders resignation from the Board	XXXVI.	381; agrees to continue on Board, 385.
Mr J. R. C. Smith of Mowhaugh nominated as an extraordinary director in room of Mr James Grieve (deceased)	XXXVIII.	436; elected, 457.
Sir Hugh Shaw Stewart, Bart., C.B., resigns office of Honorary Secretary	XLI.	415
Mr J. P. Ross Taylor nominated as a director in room of Mr Gilbert Davidson (deceased)	XL.	406; elected, 422
Chairmen of the Board. See "Chairmen."		
Representatives on other bodies. See Appendix to each volume.		

	Vol.	Page
DIRECTORS and office-bearers of the Society—		
Election of (1923-24) XXXVI. 395; (1924-25) XXXVII. 416; (1925-26) XXXVIII. 453; (1926-27) XXXIX. 421; (1927-28) XL. 417; (1928-29) XLI. 435; (1929-30) XLII. 427.		
List of. See Appendix to each volume, page 5.		
Nomination by Show districts, dates of meetings. See Appendix to each volume.		
Death of Mr W. Home Cook, C.A., auditor and Show treasurer	XLI.	408
Mr George James Gregor, C.A., appointed auditor and Show treasurer	XLI. 412; accepts office, 415; fee increased, XLII.	414
Death of Very Rev. Dr Wallace Williamson, K.C.V.O., chaplain	XXXIX.	407
Very Rev. Charles Lang Warr, M.A., appointed chaplain	XXXIX.	414; accepts office, 416; appointment confirmed, 426.
DISCOLORATION of wool—		
Letter from Skinners' Association	XXXVIII.	451
Further information to be obtained	XXXIX.	401
Deputation from Skinners' Association to be received	XL.	409
Report by Dr Tocher	XLI.	421
Dr Tocher to conduct investigation into bloom dips	XLI.	421
DISEASE, the influence of diet on susceptibility to, by J. B. Orr,		
D.S.O., M.C., M.A., M.D., D.Sc.	XLII.	28
DISEASES common to man and animals, by D. S. Rabagliati,		
O.B.E., B.Sc., F.R.C.V.S., D.V.S.M.	XXXIX.	97
DISTRICT Competitions—		
Premiums offered (Appendix) (1924) XXXVI. 52; (1925) XXXVII. 52; (1926) XXXVIII. 64; (1927) XXXIX. 60; (1928) XL. 58; (1929) XLI. 58; (1930) XLII. 58.		
Premiums awarded (1923) XXXVI. 361; (1924) XXXVII. 383; (1925) XXXVIII. 415; (1926) XXXIX. 387; (1927) XL. 381; (1928) XLI. 392; (1929) XLII. 389.		
Reports to Board and General Meetings (1923-24) XXXVI. 386, 403; (1924-25) XXXVII. 407, 425; (1925-26) XXXVIII. 443, 459; (1926-27) XXXIX. 428; (1927-28) XL. 423; (1928-29) XLI. 447; (1929-30) XLII. 416, 434.		
Committee appointed to consider whole question of grants to local Societies	XXXVI. 386; report of Committee, XXXVII.	398
Grants to Scottish National Union of Allotment Holders	XXXIX.	414; XL. 395, 397.
Permission given to Skye Agricultural Society and Sutherland Farmers' Club to hold show in 1923	XXXVI.	378
Permission given to Morayshire Farmer Club and Caithness Agricultural Society to hold show in 1923	XXXVI.	379
Question raised as to necessity of Conveners of Local Societies being members of Highland Society	XLII.	416
Request to increase money grants	XLII.	416
Rule 6 amended	XLI.	428
Stack Judging Competitions in Aberdeenshire—Application for medals	XXXVIII.	443
DR GILLESPIE Memorial Challenge Trophy handed over to Society	XLII.	412
DOGS, sheep worrying by—		
Communication regarding damage to sheep by dogs	XL.	403
Society to support resolutions adopted by Blackface Sheep Breeders' Association	XL.	407
Considered desirable that non-working dogs wear collars at all times	XL.	407
Report of conference on	XLI.	418
DONALD, Mr William, resolution on death of	XXXVIII.	447
DONALDSON, Mr W. Betts, nominated as an extraordinary director elected, 442.	XLI.	420;
DOUGLAS, Dr Charles, C.B., D.Sc., of Auchlochan (Hon. Secretary), resolution on death of	XXXVI.	389

	Vol.	Page
DRAIN tiles, railway carriage on—Society to support appeal to Railway Rates Tribunal	XL.	403
DRYING of crops in the stacks, artificial, by Professor James Hendrick, B.Sc., F.I.C.	XXXVI.	141
DUFF, Mr Thomas Gordon, of Drummur, resolution on death of	XXXVI.	373
DUMFRIES and Galloway, manuring of crops in, by John Gillies, N.D.A., N.D.D.	XLII.	152
DUMFRIES Show, 1922— Alterations in Prize List	XXXVI.	362
DUMFRIES Show, 1930— Assistant stewards appointed	XLII.	421
Ayrshire cows in milk, to be milked out in ring	XLII. 419, 422, 424	
Bacon Pig Competition	XLII. 412 : grant of £40, 419	
Blackface sheep—Additional class for tups	XLII.	415
Blackface sheep—Outwintered class deleted	XLII.	415
British Friesians—Prizes for cows from certified herds deleted	XLII.	415
Caterers appointed	XLII.	425
Convener of Local Committee, Colonel F. J. Carruthers, appointed	XLII.	412
Date of Show	XLII.	412
Dentition test for pigs—No action taken	XLII.	415
Dr Gillespie Memorial Trophy handed over to Society	XLII.	412
Dumfries and Galloway Club—Privileges of membership to directors and officials	XLII.	422
Forage Committee	XLII.	412
Forage contract fixed	XLII. 421, 425	
Free stands	XLII.	425
Fur-producing rabbits—Extended classification	XLII.	415
Gold cup for Clydesdale geldings presented by Mr William Meiklem	XLII.	412
Hotel Accommodation and Catering Committee	XLII.	412
Horse-shoeing Competition—Judges and attending members	XLII.	425
Judges appointed	XLII.	416
Judges Selection Committee	XLII.	412
Music in Showyard	XLII.	412
New Implement judges	XLII.	422
New Zealand dairy farmers to visit Show	XLII.	425
Percheron horses—To be sent for exhibition only	XLI. 422, 425	
Police arrangements	XLII.	412
Prize List and Regulations	XLII. 412 ; Appendix, 73	
Proof of Prize List submitted	XLII.	424
Rent of site	XLII.	402
Report of Special Committee regarding site	XLI.	412
Reports to General Meetings (June 1928) XLI. 436 ; (Jan. 1930) 443 ; (June 1929) XLII. 428 ; (Jan. 1930) 433.		
Scottish Women's Rural Institutes—Free stand to Central Council discontinued XLII. 415 ; grant of free stand to south-western area, 415.		
Shire horses—No class for stallions XLII. 415 ; class for colts offered, 415		
Show Contracts Committee	XLII.	412
Site at Crichton Royal not accepted	XLII.	402
Site fixed	XLII.	402
Sites Committee appointed	XLI.	426
Special prizes	XLII. 412, 416, 419, 422	
Stewards, principal, appointed	XLII.	419
Stock Judging Competition—Age limit reduced	XLII.	415
Substitution of entries—Period extended	XLII.	416
Suffolk horses—Request for class XLII. 415 ; classes for, 419, 422 ; judge appointed, 422.		
Suffolk sheep—Auction sale in Showyard	XLII.	425
Timber contract—No action taken regarding proposal that 75 per cent home timber be used XLII. 422 ; contract fixed, 425		
Times of judging and position of rings	XLII.	424
Town of Dumfries to contribute £100, &c.	XLII.	402
Veterinary inspector appointed	XLII.	419
See also "Show of 1930."		

	Vol.	Page
DUNELANE Agricultural Society—Complaint regarding Strathearn Agricultural Society holding a Show in year of Alloa Show.	XLII.	408
DUNCAN, Mr J. Bryce, of Newlands, nominated as an ordinary director in room of Colonel F. J. Carruthers, appointed Honorary Secretary	XLII. 401 ;	agrees to accept office, 405 ; elected, 428
DUNDAS, Sir Henry, Bart., resolution on death of	XLII.	424
DUNDAS, James Hamilton, appointed to list of beneficiaries of Argyll Naval Fund	XLII.	420
DUNDEE, Society invited to hold Show of 1930 at Town Council of,	XLI. 408, 426 ;	letter from XLII. 418.
DURNO, Mr James— New members proposed by Appointed to attend joint conference regarding agricultural depression	XL.	410 XLII. 426
DUBOC pigs—Society concur as to recognition of Canadian Swine Breeders' Association Records	XL.	405
DUTY on superphosphates, import, proposal regarding, to be resisted	XXXVIII.	430
'DYSENTERY, lamb,' by W. A. Pool	XLI.	47

E

ECONOMICS, some popular fallacies in farming, by James Wyllie, B.Sc., N.D.A.(Hons.), N.D.D.	XXXIX.	1
EDINBURGH Corn Markets—Grain tables (1923) XXXVI. 259; (1924) XXXVII. 276; (1925) XXXVIII. 297; (1926) XXXIX. 247; (1927) XL. 251; (1928) XLI. 271; (1929) XLII. 261.		
EDINBURGH, regional survey of—Dr T. G. Naamyth to represent Society on Committee	XXXIX.	408
EDINBURGH Show, 1927—		
Accounts, abstract of	XL.	388
Alterations in Prize List	XLI.	393
Assistant steward of sheep, Mr N. H. Constable appointed	XL.	394
Attending members appointed	XL. 393, 397; list of,	380
Awards, List of	XL. 289, 403	
Canvas destroyed at Show—Grant of £250 to contractors	XL.	410
Caterers appointed	XXXIX.	419
Catering Committee	XXXIX.	408
Convener of Local Committee, Mr J. T. M'Laren appointed	XXXIX.	411
Convener of Shows Committee, Mr G. B. Shields appointed	XXXIX.	412
Cottage ranges and grates, proposal to hold competition of	XL. 394; committee appointed, 394; regulations approved, 397; judges appointed, 399; awards, 378.	
Credit balance reported	XL.	403
Date of Show, consideration of, deferred	XXXIX. 402; amendment to recommendation by Shows Committee carried, 404; date fixed (26th to 29th July), 404; Mr Harry Armour gives notice of motion that date fixed for Show be rescinded, 408; motion submitted and defeated, 411.	
Dentition of the pig—No action taken	XXXIX.	411
Dorset Horn wool—Entry accepted for exhibition only	XL.	399
Edinburgh Town Council offer Meadows for the Show	XXXVIII.	438
Forage Committee	XXXIX.	408
Forage contractor appointed	XXXIX.	416
Forestry exhibition—Grant of £40	XXXIX. 409; grant given towards cost of exhibition and not solely as prize-money, 411.	
Free stands	XXXIX.	416
General arrangements, report of	XL.	399
Goats, Milking Competition	XXXIX. 413, 416	
Highland cattle, parade of	XL.	394

EDINBURGH Show—*continued*.

Highland cattle—Provision of additional class deferred	XL.	394
Home-fed meat, question of compulsory use of	XXXIX.	419; to be supplied at Show, XL. 394.
Horse-shoeing Competition, classes for	XXXIX.	416; judges and attending members appointed 416, 419.
Hunters—Not to leave showyard until last day	XL.	399
Judges, list of	XL.	379
Local Committee appointed	XL.	394
Meadows not accepted as a site	XXXVIII.	452
Meeting of members in showyard	XL.	419
Meteorological demonstration approved	XXXIX.	419; XL. 394
New implements—Judges appointed	XXXIX.	419
Percheron horse accepted for exhibition only	XL.	399; medal to, 401
Perpetual Gold Challenge Cups, question regarding names of winners being engraved on	XXXIX.	416; names to be engraved on plates attached to plinths, 419.
Poultry—Classes for Exchequer Leghorns and Columbian Wyandottes	XXXIX.	413, 416
Prize List and Regulations	XXXIX.	409, 411, 419; Appendix 75
Rabbits—Judge appointed	XXXIX.	417
Red Poll cattle—Class amended	XXXIX.	419
Report of	XL.	258
Reports to General Meetings (Jan. 1925)	XXXVII.	425; (June 1925) XXXVIII. 454; (Jan. 1926) 458; (June 1926) XXXIX. 423; (Jan. 1927) 427; (June 1927) XL. 418; (July 1927) 419; (Jan. 1928) 423.
Saughton Park—Society offer £500 for cost of levelling and restoring ground	XXXVIII.	452; accepted as a site for Show, XXXIX. 400.
Show Contracts Committee	XXXIX.	408
Single judging—Selection Committee appointed	XXXIX.	409; draft regulations, 414, 417.
Site of Show. See under "Show of 1927."		
Sites Committee appointed	XXXVII.	412
Society to provide alternative ground for cricketers	XXXVIII.	438
South African farmers, proposed visit of	XL.	394; to give dinner to, 395; committee appointed, 395; dinner arranged, 399.
Special prizes	XXXIX.	409, 412, 413, 417
Stewards appointed	XXXIX.	413
Stock Judging Competition, regulations for	XXXIX.	417; additional regulations, 419; Committee appointed, XL. 394.
Suffolk horses—Entries accepted for exhibition only	XL.	397; parade of, 399; medals to, 401.
Timber contract, tender accepted	XXXIX.	416; Shows Committee to consider supply of home timber, 417; tenders for home timber to receive preference, 420.
Veterinary inspector, Professor A. Gofton, F.R.C.V.S., appointed	XXXIX.	413
Votes of thanks	XL.	419
Wool—Latest time to be in showyard	XXXIX.	419
See also "Show of 1927."		

EDINBURGH Show, 1931. See "Hundredth" Show.

EDINBURGH University—

Application for grant towards endowment of a Department of Research in Animal Breeding XXXIX. 418; grant of £1000, 420; confirmed, XL. 395, 418.

EDMOND, Mr John, of Gallamuir, resolution on death of . . . XXXVI: 380

EDUCATION. See "National Diplomas" in agriculture and dairying, and "Forestry" examinations.

EDUCATION and Research, Departmental Committee on Agricultural—

Representatives appointed to give evidence before . . . XXXVI. 394
Report evidence given . . . XXXVII. 398

	Vol.	Page
Eggs, quantity and value of, imported into United Kingdom	(1923)	
XXXVI. 257; (1924) XXXVII. 274; (1925) XXXVIII. 295;		
(1926) XXXIX. 245; (1927) XL. 249; (1928) XLI. 269; (1929)		
XLII. 259.		
ELDER, Mr James—		
Appointed as representative to attend conference on agricul-	XXXVII.	406
tural policy		
Appointed as representative to a meeting regarding proposed		
Wild White Clover Growers' Association	XXXIX.	401
ELDER, Mr Thomas, appointed representative to a joint meeting		
regarding warble fly pest	XXXVIII.	433
ELECTION of office-bearers. See "Directors."		
ELECTRIC tractor—		
Proposal by Mr Andrew M'Dowall that Society offer prize of		
£5000 for effective method of reducing costs of cultivation	XXXVI.	391
Proposal remitted to Special Committee	XXXVI.	394
Proposal not entertained	XXXVII.	410
Request that Society apply for grant of £3000 from Develop-		
ment Commission	XLI.	418
Request refused	XLI.	425
ELECTRICITY Board, Central, Mr G. S. Davidson recommended		
as a member of	XXXIX.	415
ELECTRICITY supply in rural areas—		
Report of a conference regarding	XLII.	409
Views of Society as to findings of conference requested	XLII.	413
Representatives agree with notes of conference	XLII.	416
Draft bill to be circulated to bodies interested	XLII.	416
ELGIN AND KINCARDINE, The Earl of—		
Official visit, as His Majesty's Lord High Commissioner, to		
General Meeting	XXXIX.	421
Appointed to attend meeting regarding railway freights	XLI.	411
ELLIOT, Mr John—		
To represent Society at a meeting regarding proposed Wild		
White Clover Growers' Association	XXXIX.	401
To attend meeting regarding damage by deer	XLI. 422; XLII. 411,	423
ELLIOT, Mr Thomas, to give evidence before Committee on Land		
Settlement in Scotland	XL.	401
ELLIOT, Mr William, resolution on death of	XLI.	433
EMPIRE farmers' tour to New Zealand, letters regarding	XLII.	410
ENGINE wheels, studs on traction—		
Representative attends a conference	XXXVII.	407
Report of conference	XXXVII.	407
ENGINEER, consulting, salary increased	XLII.	409
ENSILAGE, clay farming and, by James Cruickshank	XXXVII.	23
ENTERTAINMENT Tax—		
Request that Society call a conference regarding	XXXVIII.	429; not
entertained, 429.		
Letter from East Lothian Agricultural Society	XXXVIII.	446
ENTOMOLOGICAL Department—		
Conditions and regulations will be found in the Appendix to		
each volume.		
Insect and other pests (1923) XXXVI. 100; (1924) XXXVII. 167;		
(1925) XXXVIII. 151; (1926) XXXIX. 131; (1927) XL. 116;		
(1928) XLI. 137.		
Report to General Meeting regarding wheat bulb fly, Colorado		
beetle, and warble fly pest	XXXVI.	397

	Vol.	Page
ENTOMOLOGY, International Congress of, Dr R. Stewart Mac-Dougall to represent Society at Zurich	XXXVIII.	433; and at Cornell University, XL. 416.
Essays and reports—Premiums offered. See Appendix to each volume.		
EVOLUTION of the fertiliser industry, by Professor James Hendrick, B.Sc., F.I.C.	XXXIX.	79
EXPERIMENTS, pig-feeding and cattle-feeding, by Principal W. G. R. Paterson, B.Sc.	XXXVI.	161
EXPERIMENTS, some hay and pasture, by Principal W. G. R. Paterson, B.Sc., N.D.A.(Hons.)	XL.	40
EXPORTATION of Scottish pedigree stock—		
Restrictions on exportation	XXXVIII.	438
Representations to be made to colonies	XXXVIII.	438
Letters from colonies	XXXVIII.	443
Report of deputation to colonial commissioners	XXXVIII.	445
Canadian Government not prepared to allow Scottish importation	XXXVIII.	447
Direct shipment from Scotland to Australia	XXXIX. 399, 401; XL. 393; XLI. 434.	
F		
FAIR, Milan, attention drawn to date of	XXXVI.	381
FALLOW, bare, acreage in each county of Scotland (1923) XXXVI. 247; (1924) XXXVII. 264; (1925) XXXVIII. 284; (1926) XXXIX. 234; (1927) XL. 238; (1928) XLI. 257; (1929) XLII. 247.		
FARM management, scientific, by James Wyllie, B.Sc., N.D.A.(Hons.), N.D.D.	XXXVII.	104
FARM management, some problems in, by James Wyllie, B.Sc., N.D.A.(Hons.), N.D.D.	XLI.	21
FARM, poultry on the, by Miss Agnes Kinross, N.D.D.	XXXVIII.	120
FARMERS', empire, tour to New Zealand	XLII.	410
FARMERS, South African, visit to Edinburgh Show, 1927	XL. 394; dinner to, 395, 399.	
FARMING and ensilage, clay, by James Cruickshank	XXXVII.	23
FARMING economics, some popular fallacies in, by James Wyllie, B.Sc., N.D.A.(Hons.), N.D.D.	XXXIX.	1
FARMING, fourteen years' successful poultry, by Arthur G. Ruston, B.A., D.Sc., and C. V. Dawe, M.Com.	XL.	70
FEDERATION, British Wool—Letter regarding serious decline in wool production	XXXVII.	400
FEEDING, cattle, by Principal W. G. R. Paterson, B.Sc., N.D.A.(Hons.)	XLII.	37
FEEDING experiments, pig and cattle, by Principal W. G. R. Paterson, B.Sc., N.D.A.(Hons.)	XXXVI.	161
FEEDING for milk production, by Andrew C M'Candlish, Ph.D., M.S.A., B.Sc.(Agric.), N.D.A., N.D.D.	XXXVIII.	55
FEEDING, pig (indoor <i>versus</i> outdoor fattening), by Principal W. G. R. Paterson, B.Sc., N.D.A.(Hons.)	XXXVII.	86
FEEDING, potatoes in stock, by J. K. Thompson, N.D.A.	XLII.	128
FEEDING standards, by Professor J. A. Scott Watson, B.Sc.	XL.	1
FEEDING-stuff, no action taken regarding complaint as to price of	XXXVIII.	431

	Vol.	Page
FEEDING-stuffs and fertilisers, proposed standard tables of un-exhausted values of—Mr J. T. M'Laren to attend conference in London XXXVII. 410; report of conference, 412		
FEEDING value, the relation of the chemical composition of pasture to it, by J. B. Orr, D.S.O., M.C., M.D., M.B., D.Sc.	XLI.	99
FEEDING <i>versus</i> manuring for beef production during the grazing season, by Principal W. G. R. Paterson, B.Sc., N.D.A.(Hons.)	XXXIX.	60
FERGUSSON-BUCHANAN, Lt.-Col. G. J., resolution on death of	XLI.	419
FERRIE, the late Mr David, photograph of, accepted	XXXVI.	381
FERTILISER industry, evolution of the, by Professor James Hendrick, B.Sc., F.I.C.	XXXIX.	79
FERTILISERS—Question raised at General Meeting	XL.	419
FERTILISERS and feeding-stuffs— Prices of—See Appendix to each volume. Report on residual values of	XL.	413
FERTILISERS and Feeding Stuffs Act— Sir David Wilson, Bart., D.Sc., to give evidence before Departmental Committee XXXVI. 383 Mr John Speir to give evidence in place of Sir David Wilson. XXXVI. 384 Information to be obtained from County Councils XXXVI. 384 Observations to be submitted to Advisory Committee XXXVIII. 430 Memorandum regarding XLII. 407 Report by Dr J. F. Tocher to General Meeting (June 1924) XXXVII. 418-420.		
FERTILITY, some points about soil, by Professor James Hendrick, B.Sc., F.I.C.	XXXVIII.	195
FEVER, milk, by Professor J. Russell Greig	XLI.	115
FEVER, milk, investigation into—Grant of £50 to Royal (Dick) Veterinary College	XLI. 419; confirmed, 423, 443	
FINANCE and law— Accounts. See "Accounts." Agricultural Credits (Scotland) Bill to be submitted to law agents XLI. 423; report by law agents, 425 Agricultural depression—Society to convene joint meeting XLII. 422; representatives to attend further joint meeting, 426. Allowance to Mrs Cowie XXXVIII. 439 Animal Diseases Research Association—Grant of £200 (1926) XXXIX. 403; £200, (1927) XL. 398; £200, (1928) XLI. 409; £200, (1929) XLII. 405 Association for Preservation of Rural Scotland—Subscription of £2, 2s. for 1928 XLI. 407 Auditor and Show Treasurer—Death of Mr W. Home Cook, C.A. XLI. 408; Mr George J. Gregor, C.A., appointed, 412; accepts office, 415; fee increased, XLII. 414. Bye-laws, revision of—Memorandum from law agents XLII. 417 Canvas destroyed at Edinburgh Show—Grant of £250 to contractors XL. 410 Caretaker, death of Mr Andrew Brown XLI. 423; Mr C. J. Balfour appointed, 423; Mr James P. Lauder appointed, XLII. 409. Chief clerk, death of Mr E. M. Cowie XXXVIII. 432; Mr J. G. Yardley appointed, 439. Consulting engineer—Salary increased XLII. 409 Cowie, Mrs, allowance to XXXVIII. 439 Department of Research in Animal Breeding, University of Edinburgh—Application for grant XXXIX. 418; grant of £1000, 420; XL. 395, 418. Expenses of N.D.A. examination, request that Society inquire into XXXVI. 401 Glasgow Veterinary College—Grant of £500 on condition that £10,000 aimed at is raised within one year XLI. 423		

	Vol.	Page
FINANCE—continued.		
Hannah Dairy Research Institute, grant of £1500 to	XLII.	417
Highland Reel and Strathspey Society—Grant of £30 (1929)	XLII.	409
International Congress of Entomology—Grant of twenty-five guineas to Dr R. Stewart MacDougall towards expenses attending	XL.	416
International Dairy Congress—Financial support deferred	XXXIX.	405 ;
grant of twenty-five guineas, XL. 416 ; delegates appointed, 416.		
Joint-Committee of Live-Stock Breeders—Grant of £10, 10s. and annual affiliation fee of £1, 1s.	XLI.	419
Long service awards—Question raised at General Meeting	XXXVII.	422
Members' privileges in respect of analyses—Conditions amended	XXXVII.	410
New premises—Committee appointed to inspect building at 100 Princes Street	XXXVI.	377 ;
purchase of 8 Eglinton Crescent, XLI. 407 ; special committee appointed, 413 ; 3 George IV. Bridge sold, XLII. 423. See also under "Premises."		
Potato Marketing Board, no donation to	XLII.	423
Reports to General Meetings	(1924) XXXVI. 399 ; (1925) XXXVII. 421 ; (1926) XXXVIII. 457 ; (1927) XXXIX. 427 ; (1928) XL. 422 ; (1929) XLI. 443 ; (1930) XLII. 433.	
Rowett Research Institute—Application for grant refused	XXXVI.	387 ;
grant of £1000 towards cost of Experimental Stock Farm, XLI. 407.		
Royal (Dick) Veterinary College—Grant of £250 to Centenary Fund	XXXVI.	383 ;
grant of £20 towards cost of investigation into dentition of the pig, XL. 407 ; grant of £50 towards cost of investigation into milk fever, XLI. 419 ; Mr J. E. Kerr appointed trustee to Centenary Post-Graduate Fellowship, XLII. 421.		
St Kilda—		
Flour and oatmeal for islanders	XXXVI.	376 ; XL. 396 ; XLI. 409, 413 ; XLII. 405, 409.
Tender accepted for flour and oatmeal	XXXVI.	379
Request for new boat	XXXIX.	399 ; new boat to be purchased, 403
Scottish Agricultural Organisation Society—Grant of £100	(1927) XXXIX.	412 ; £100, (1928) XL. 405 ; £100, (1929) XLI. 423 ; £100, (1930) XLII. 417.
Scottish National Milk and Health Association—Grant of £100	(1925) XXXVIII.	434 ; £100, (1927) XL. 398 ; £50, (1928) XLI. 407 ; £50, (1929) XLII. 409.
Scottish Timber, &c., Exhibits Committee—Grant of £50,	XXXVI.	384
Second clerk, death of Mr R. C. Todd	XLI.	413 ; Mr John Watt appointed, 433.
Secretary—Salary increased	XXXVI.	389
Show accounts—Question of outstanding accounts raised at General Meeting	XXXVII.	422
Show premiums to be paid from ordinary account if necessary	XXXVI.	384
Staff salaries	XXXVI. 389 ; XXXIX. 412 ; XL. 410 ; XLII. 414	
Statement by Mr Falconer L. Wallace as to finances of the Society	XXXVI.	400
Warble fly investigation—Grant of £500 towards cost of experiments in Scotland	XLII.	422
World's Dairy Congress. See under "International Dairy Congress."		
FIRE insurance of woods—Representatives appointed to a conference	XLII.	413
FLOUR , English, &c.—Society to support scheme for grading and marking of	XLII.	416
FLY , warble. See "Warble."		
FOALS , navel ill or joint evil in, by Professor John R. McCall, M.R.C.V.S., F.R.S.M.	XXXVI.	84
FOOD products, quantity and value of, imported into the United Kingdom	(1923) XXXVI. 254 ; (1924) XXXVII. 270 ; (1925) XXXVIII. 291 ; (1926) XXXIX. 241 ; (1927) XL. 245 ; (1928) XLI. 265 ; (1929) XLII. 255.	

	Vol.	Page
Foot and mouth disease—		
Deputation to meet Minister of Agriculture at Royal Show,		
Reading	XXXIX.	406, 426; report of deputation, 409
Embargo on fresh meat from continent	XXXIX.	406
Infection from second-hand sacks	XXXVI.	388, 390; XXXVII. 395
Monetary reward by Society towards discovering immunity from, motion regarding	XXXVI.	391
Monetary reward considered unnecessary	XXXVI.	393, 394; XXXVII. 418
Motion by Mr Lyon Guild at General Meeting	XXXVI.	402; amendment by Mr J. T. M'Laren, 402; report to General Meeting, XXXVII. 418.
Outbreak at Carlisle traced to pig carcasses from continent	XXXIX.	404; resolution to Prime Minister and others as to stoppage of imports of carcasses, &c., from continent, 405.
Outbreak in England	XL.	408
Royal Dublin Society, letter from, regarding insinuations that outbreak traceable to Ireland	XXXVI.	392
Sir Stewart Stockman, letter from, regarding valuers carrying infection	XXXVII.	395
Statement to General Meeting in Kelso showyard, 1926	XXXIX.	426
Stock to be sent to Perth Show on licence	XXXVII.	399
FORAGE crops, winter, and their place in a scheme of cropping,		
by Professor W. G. R. Paterson, B.Sc., N.D.A. (Hons.)	XXXVIII.	106
FORBES, Mr Alexander, to represent Society on a Home Pig		
Production Development Committee	XXXIX.	406
FORESTRY certificates—		
Syllabus of, and winners of certificates will be found in the Appendix to each volume.		
Syllabus revised	XXXVII.	407; XXXVIII. 431
Syllabus finally adjusted	XXXVIII.	446
Examination for (1930)	XLII.	423; examiners appointed, 424
FORTEVIOT, Baron, of Dupplin, resolution on death of		
	XLII.	415
FOURTEEN years' successful poultry farming, by Arthur G.		
Ruston, B.A., D.Sc., and C. V. Dawe, M.Com.	XL.	70
FREE life members, diploma holders as. See end of official list of members.		
FREIGHTS, reduction in railway, representatives appointed to attend conference regarding		
	XLI.	411; report of proceedings at conference, 418
FRIESLAND herd-book of South Africa, Society concur as to recognition of		
	XXXVIII.	439
FRUIT, acreage in each county of Scotland		
	(1923) XXXVI.	247; (1924) XXXVII. 264; (1925) XXXVIII. 284; (1926) XXXIX. 234; (1927) XL. 238; (1928) XLI. 257; (1929) XLII. 247.
FRUIT, vegetables, &c., quantity and value of, imported into the United Kingdom		
	(1923) XXXVI.	255; (1924) XXXVII. 272; (1925) XXXVIII. 293; (1926) XXXIX. 243; (1927) XL. 247; (1928) XLI. 267; (1929) XLII. 257.
FUNDS, state of the. See "Accounts."		
GALLOWAY Cattle Society hands over Dr Gillespie Memorial Challenge Trophy to Society		
	XLII.	412
GALLOWAY, manuring of crops in Dumfries and, by John Gillies, N.D.A., N.D.D.		
	XLII.	152
GARDENS, allotment. See "Allotment."		
GENERAL Meetings, proceedings at. See "Proceedings."		

GENERAL Shows—

Accounts, question raised at General Meeting regarding out-standing	XXXVII.	422
Ages of cattle—No dentition test to be imposed	XXXVIII.	444, 448
Alcoholic drinks—Report of observations at Aberdeen Show, 1928	XLI. 416; report by sub-committee,	421
Attendants' boxes, no oil stoves to be used in	XXXVI.	376
Attendants for goats, better accommodation for	XL.	406
Auction sale of large white Ulster pigs	XXXVIII.	435
Ayrshire cows, alteration of shedding for	XL.	406
Ayrshire cows—Request to amend Rule 32 not entertained	XXXVIII.	445
Ayrshire cows and heifers—Actual milk yield to be entered in catalogue	XXXVII.	414
Ayrshire cows in milk, to be milked out in the ring	XLII. 419,	422
Bacon Pig Competition to be held by Society	XLII. 412; grant of £40,	419
Bacon pigs, free stand and grant of £25 for first competition of	XXXVII.	406
British Friesian cows, alteration to shedding for	XL.	406
Canvas destroyed at Edinburgh Show, 1927—Grant of £250 to contractors	XL.	410
Champion challenge cup for harness horses offered	XXXVII.	406;
handed over, XXXVIII. 437.		
Children's riding ponies, classes instituted for	XXXVII.	409
Circuit of shows	XXXIX.	409, 412
Cooking accommodation for attendants' meals	XXXVI.	376, 378
Cooking by attendants	XXXVII.	398
Cottage ranges and grates, proposal to hold competition for regulations approved, 397; judges appointed, 399; awards, 378.	XL.	394;
Cows from Grade A. (T.T.) or certified herds—Special prizes and regulations	XLI. 411,	420
Dentition of the pig—No action taken	XXXIX. 411; XLII. 415; report of investigation into, XLI. 417.	
Dexter cattle, classes for	XXXVIII.	447
Directors not to be attending members on stock in which they are interested	XXXVII.	398
Dr Gillespie Memorial Challenge Trophy handed over to Society	XLII.	412
Dorset Horn sheep, classes instituted for	XXXVI. 385,	388
Draught geldings, larger boxes for	XL.	406
Draught geldings—Open to those got by Clydesdale stallions	XL.	412
Dun Galloways eligible for Galloway classes	XXXVI.	388
Entries of stock—Rule regarding number of entries and exhibitors	XL.	406
Extra stock, Rule 35 to apply to	XXXVII.	398
Forestry exhibition—Grant increased	XXXVII. 409; money formerly given as prize money to be given as a grant, XXXIX. 411.	
Foot and mouth disease—Return of entry fees	XXXIX.	406
Fur-producing rabbits, classes instituted for	XXXVII. 409, 411; XXXVIII. 428; classification extended, XLII. 415.	
Glasgow Champion Challenge Cup offered	XXXVII. 406; handed over, XXXVIII. 437.	
Goats, Milking Competition	XXXIX. 413, 416; XLI. 425	
Grade A. (T.T.) or certified herds—Special prizes and regulations	XLI. 411,	420
Grand stand—Charges for reserved portion reduced	XLII.	425
Grand stand—Standing gallery extended to both ends, and both ends to be free	XLII.	402
Highland cattle, parade of	XL.	394
Highland ponies and Western Island ponies not to be judged at the same time	XXXVI.	374
Home-fed meat, compulsory use of, at shows	XXXIX. 419; XL. 394,	415
Horses, veterinary inspection of	XLI. 428; horses with colds to be excluded from showyard, 434.	
Judges—Suggestion to discontinue sending out nomination forms not adopted	XXXIX.	417
Kinmount Challenge Cup presented to Society	XXXVI.	398
Lady members' pavilion—Reserved for lady members only	XL.	412;
additional tickets for, 412.		
Large white Ulster pigs—Classes instituted for	XXXVII.	406

	Vol.	Page
GENERAL Shows—continued		
Licensed stands, extra buffet added to	XLII.	402
Live-Stock Judging Competition—Regulations for	XXXIX. 417; addi-	
tional regulations, 419; revised regulations, XL. 412.		
MacRobert Champion Silver Bell handed over	XXXVIII.	457
"Meiklem" Gold Challenge Cup presented for Clydesdale geldings	XLII.	412
Milk yield certificates, new rule regarding	XL.	406
New implements to be judged on Monday before Show	XXXVIII.	451
Outwintered Blackface rams—Regulation modified	XXXVI. 377; protest against alteration of conditions, 380.	
Overseas visitors, hospitality to	XXXVII. 409, 413, 414; XLII.	425
Percheron horse accepted for exhibition only XL. 399; silver medal to, 401; further entries for exhibition only, XLII. 422, 425.		
Perpetual Gold Challenge Cups—Suggestion as to engraving names of winners on	XXXIX. 416; names to be engraved on plates attached to plinths, 419.	
Poultry—Classes for Exchequer Leghorns and Columbian Wyandottes	XXXIX. 413, 416	
Premiums to be paid from ordinary account if necessary	XXXVI.	384
President's Medals for Sheep Classes		XL. 412
Rabbits. See "Fur-producing."		
Red Poll cattle—Alteration to class	XXXIX.	419
Rule 1 amended	XXXVII.	411
Rule 30, as to fat stock, to be retained	XLI.	420
Rule 33, interpretation of, as regards heifers in calf	XXXVI.	377
Rule 106—Maximum space for stands increased	XXXVIII.	430
Shepherd's pack classes instituted for Kelso Show, 1926	XXXVIII. 441, 445	
Shetland ponies—Special class for geldings	XL.	409
Shire horses—Classes instituted for XL. 408, 411; protest against class for produce of stallions, XLI. 410; class for stallions not entertained, XLII. 415		
Show jumps—Olympia pattern jumps to be provided	XXXVI.	388
Single judging—Notice of motion XXXIX. 402; motion submitted, 404; remitted to Special Committee, 404; report of Special Committee, 409, 414; Selection Committee appointed, 409; draft regulations approved, 417; complete regulations, 417; requests to discontinue not acceded to, XLI. 417, 434, 441; two judges to be appointed for large classes, 417.		
Stand rents—Reduced charges	XXXVIII.	448
Stewards, amendment in appointment of	XLII.	419
Stock entries—New rule regarding number of entries and exhibitors	XL.	406
Stock Judging Competition. See "Live Stock."		
Substitution of entries after closing date	XXXVI. 385; period extended, XLII. 416.	
Suffolk horses accepted for exhibition only XL. 397, 399; medals granted to, 401; classes for, XLII. 419, 422.		
Suffolk sheep, auction sale of, in Showyard	XLI. 425; XLII. 425	
Timber—Whole question of supply to be considered	XXXIX. 417; tenders for home timber to receive preference, 420; suggestion that 75 per cent home timber be used, XLI. 428; no action taken, XLII. 422.	
Wales, H.R.H. the Prince of—Visit to Kelso Show, 1926	XXXIX. 403, 424	
Western Island ponies—Maximum height reduced to 14 hands	XXXVI.	385
Wool—Latest time to be in showyard	XXXIX.	419
Wool—Classes for Oxford Down, Suffolk, and Dorset Horn wool	XL.	412
GENERAL Strike 1926—Acceptance of entries for Kelso Show	XXXIX.	402
GENETICS in relation to live-stock breeding, by F. A. E. Crew, M.D., D.Sc., Ph.D., &c.	XXXVII.	146
GEOLOGICAL Society of London resumes publication of 6-inch ordnance survey maps	XXXVII.	413
GERMAN oats, importation of—Representatives appointed to attend a conference regarding	XLII.	416

	Vol.	Page
GIBB, Dr R. Shirra, resolution on death of	XXXVI.	390
GILLESPIE Memorial Challenge Trophy, Dr, handed over to Society	XLII.	412
GILMOUR, W. P.—		
To attend a conference regarding proposed National Dairy Council for Scotland	XXXVII.	397, 404
To attend meeting regarding International Dairy Congress	XXXVII.	414 ;
reports proceedings at meeting, XXXVIII. 429 ; to represent Society at International Dairy Meeting, 440 ; and on Finance Committee, XXXIX. 406.		
Appointed to fill vacancy on Agricultural Advisory Committee	XXXVIII.	446, 447
To represent Society at a meeting regarding World's Dairy Congress	XL.	393 ; delegate to World's Dairy Congress, 416
Representative on Council of National Milk and Health Association	XL.	398 ; reappointed, XLI. 407
GLANDERS—		
Letter from Yorkshire Agricultural Society remitted to Science Committee	XXXVI.	383
Report of Science Committee	XXXVI.	388
GLASGOW Agricultural Society—Request for grant refused	XXXVIII.	452
GLASGOW Show, 1925—		
Abstract of accounts	XXXVIII.	422
Alterations in Prize List	XXXIX.	388
Attending members—Appointed	XXXVIII.	427, 431 ; list of, 414
Awards, List of	XXXVIII.	339
Ayrshire cows and heifers—Actual milk yield to be entered in catalogue	XXXVII.	414
Bacon Pig Competition—Free stand and grant of £25	XXXVII.	406
Bee appliances—Classes deleted	XXXVII.	406
Blackface sheep—Alteration in classes	XXXVII.	406
Caterers appointed	XXXVII.	414
Cheviot sheep—Class for tup lambs	XXXVII.	406
Children's riding pony classes	XXXVII.	409
Convener of Local Committee, Sir Thomas Paxton, Bart., appointed	XXXVII.	406
Credit balance reported	XXXVIII.	436, 458
Date fixed	XXXVII.	399, 402
Directors to receive privileges of membership of Glasgow Conservative Club	XXXVIII.	433
Draught geldings in harness, class for	XXXVII.	406
Forage Committee	XXXVII.	403
Forestry Exhibition—Grant of £20	XXXVII.	403 ; grant increased to £40, 409.
Fur-producing rabbits—Classes for	XXXVII.	409, 411 ; judges appointed, XXXVIII. 428.
General arrangements	XXXVIII.	433
Glasgow Agricultural Society—Free stand granted	XXXVII.	414 ;
request for grant refused, XXXVIII. 452.		
Glasgow Champion Challenge Cup offered for harness horses	XXXVII.	406 ; handed over, XXXVIII. 437.
Gloucester Old Spots pig classes deleted	XXXVII.	406
Harness classes	XXXVII.	406
Horse-shoeing Competition	XXXVII.	411 ; judges and attending members appointed, 413.
Hospitality to overseas visitors	XXXVII.	409, 413, 414
Hotel and Catering Committee	XXXVII.	403, 414
Hunter classes	XXXVII.	406
Judge of Border Leicester sheep	XXXVIII.	433
Judges appointed	XXXVII.	406 ; list of, XXXVIII. 413
Large white Ulster pigs, classes for	XXXVII.	406 ; auction sale in showyard, XXXVIII. 435.
Local Committee appointed	XXXVIII.	427
MacRobert Champion Silver Bell handed over	XXXVIII.	457
Maximum space for stands increased—Rule 106 amended	XXXVIII.	430

	Vol.	Page
GLASGOW Show—continued.		
Meteorological office—Permission to give weather forecasts at Show	XXXVIII.	428
Middle white pigs—Additional class	XXXVII.	409
New implements—Judges appointed	XXXVII.	414
No protests	XXXVIII.	434
Prize List and Regulations	XXXVII. 403, 406, 413; Appendix 67	
Report of	XXXVIII.	304
Reports to General Meetings (June 1923) XXXVI. 396; (January 1924) 401; (June 1924) XXXVII. 417; (January 1925) 422; (June 1925) XXXVIII. 454; (July 1925) 455; (January 1926) 458.		
Rule 1 amended	XXXVII.	411
Rule 106 amended	XXXVIII.	430
Rural industries—Judges appointed	XXXVIII.	428
Scottish Savings Committee—Free stand to	XXXVIII.	431
Shetland ponies—Class for ponies in saddle	XXXVII.	414
Show Contracts Committee	XXXVII.	403
Site fixed	XXXVI.	374
Society's headquarters	XXXVII.	414
Special prizes	XXXVII. 403, 406, 409, 411	
Stack drying demonstration	XXXVIII. 428, 430	
Stewards appointed	XXXVII.	408
Stewards of stands appointed	XXXVIII. 428, 433	
Stock from Royal Show—Question as to being debarred	XXXVIII.	433
Timber contract fixed	XXXVII.	411
Times of judging and parades	XXXVII.	414
Veterinary surgeon, Professor John R. M'Call, M.R.C.V.S., appointed	XXXVII.	408
Votes of thanks	XXXVIII.	456
Wreath for Glasgow Cenotaph	XXXVIII.	435
See also "Show of 1925."		
GLASGOW Veterinary College—		
Letter regarding maintenance of the College as a teaching institution	XXXVII.	411
Application for grant	XLI.	417
Grant of £500 if sum aimed at is raised within one year	XLI. 423; confirmed, 426, 443.	
GORTON, Professor A., F.R.C.V.S., appointed Veterinary Inspector for Edinburgh Show, 1927	XXXIX.	413
GOLD Challenge Cups, Perpetual—Suggestion that names of winners be engraved on XXXIX. 416; names of winners to be engraved on plates attached to plinths, 419.		
GORDON, Mr A. P., to give evidence before Committee on Land Settlement in Scotland	XL.	401
GOTHENBURG Agricultural Show and Exhibition, representation at directors to attend, 377.	XXXVI. 375;	
GRADE "A" (T.T.) or certified herds—Special prizes for XXXI. 411, 420; letter regarding order prohibiting exhibiting of, at Shows, XLII 424.		
GRADING and marking of beef, &c.—		
Society to support scheme of Central Chamber of Agriculture	XLII.	416
GRAIN, prices of, in Edinburgh Market (1923) XXXVI. 259; (1924) XXXVII. 276; (1925) XXXVIII. 297; (1926) XXXIX. 247; (1927) XL. 251; (1928) XLI. 271; (1929) XLII. 261.		
GRANT, Mr Peter—		
Nominated as a director in room of Mr Andrew B. Leitch (deceased)	XXXVII. 406; elected, 421	
Resolution on death of	XLII.	410

GRANTS by Society—

£1000—Animal Breeding Research Department, University of Edinburgh	XXXIX. 420; XL. 395, 418
£200—Animal Diseases Research Association (1926)	XXXIX. 403, 404, 422
£200—Animal Diseases Research Association	(1927) XL. 398, 400, 418
£200—Animal Diseases Research Association	(1928) XLI. 409, 412, 436
£200—Animal Diseases Research Association	(1929) XLII. 405, 408, 428
£10, 10s. and annual affiliation of £1, 1s. to Joint Committee of British Live-stock Breeders	XLI. 419
£500—Glasgow Veterinary College, if £10,000 aimed at is raised within one year	XLI. 423, 426, 443
£1500—Hannah Dairy Research Institute for equipment and towards endowment fund	XLII. 417, 420, 433
£30—Highland Reel and Strathspey Society	(1929) XLII. 409, 428
£1000—Rowett Research Institute, towards cost of experimental stock farm	XLI. 407, 409, 436
£250—Royal (Dick) Veterinary College—Centenary Fund	XXXVI. 383
£20—Royal (Dick) Veterinary College, towards cost of investigation into dentition of the pig	XL. 404, 407, 422
£50—Royal (Dick) Veterinary College, towards cost of investigation into milk fever	XLI. 419, 423, 443
£100—Scottish Agricultural Organisation Society (1927)	XXXIX. 412, 414, 427
£100—Scottish Agricultural Organisation Society (1928)	XL. 405, 407, 422
£100—Scottish Agricultural Organisation Society (1929)	XLI. 423, 426, 443
£100—Scottish Agricultural Organisation Society (1930)	XLII. 417, 420, 433
£100—Scottish National Milk and Health Association (1925)	XXXVIII. 434, 455
£100—Scottish National Milk and Health Association (1927)	XL. 398, 400, 418
£50—Scottish National Milk and Health Association (1928)	XLI. 407, 409, 436
£50—Scottish National Milk and Health Association (1929)	XLII. 409, 428
£5 (1924) XXXVI. 399; £5 (1925) XXXVII. 421; £5 (1926) XXXVIII. 457; £5 (1927) XXXIX. 427; £10 (1928) XL. 422; £10 (1929) XLI. 443; £10 (1930) XLII. 433, to Scottish Society for Prevention of Cruelty to Animals.	
£50—Scottish Timber, &c., Exhibits Committee	XXXVI. 384
£250—John Unite, Ltd., towards cost of canvas destroyed at Edinburgh Show, 1927	XL. 410
£500 towards cost of warble fly experiments in Scotland	XLII. 422
£26, 5s.—World's Dairy Congress	XL. 416

GRANTS to local societies. See "District Competitions."

GRASS sickness in horses—

Account of whole investigation	XXXVI. 65
Angus Agricultural Society—Final grant of £25	XXXVI. 378
Further investigation by Ministry of Agriculture, Animal Diseases Research Association, and others	XXXVI. 399, 404
Letter from Sir Stewart Stockman regarding receipt of grants	XXXVII. 405
Perthshire Agricultural Association not to contribute further	XXXVI. 378
Dr J. F. Tocher to prepare account of whole investigation	XXXVI. 386
Society not to contribute further	XXXVII. 404
Statements by Dr Tocher to General Meetings	XXXVI. 403; XXXVII. 420

GRASS sickness in horses, by Dr J. F. Tocher XXXVI. 65

GRASSES under rotation, acreage in each county of Scotland (1923) XXXVI. 247; (1924) XXXVII. 264; (1925) XXXVIII. 284 (1926) XXXIX. 234; (1927) XL. 238; (1928) XLI. 257; (1929) XLII. 247.

GRASSLAND conference, proposed—

Letter from Nitram Ltd.	XL. 409
Suggestion that Society convene a conference on	XL. 409
Recommended that subject be discussed by agricultural section of British Association	XL. 409; XLI. 405

GRASSLAND, notes on intensive cultivation of, by William Low . XLII. 113

	Vol.	Page
GRASSLAND problems, some, by Professor J. A. Scott Watson, B.Sc.	XXXVI.	25
GRAY, Mr James, Glenoonah, resolution on death of	XLII.	418
GRAZING season, manuring <i>versus</i> feeding for beef production during the, by Principal W. G. R. Paterson, B.Sc., N.D.A. (Hons.)	XXXIX.	60
GREEN crops, acreage in each county of Scotland (1923) XXXVI. 247; (1924) XXXVII. 264; (1925) XXXVIII. 284; (1926) XXXIX. 234; (1927) XL. 238; (1928) XLI. 257; (1929) XLII. 247.		
GREGOR, Mr George J., C.A., appointed auditor and show treasurer accepts office, 415; fee increased, XLII. 414.	XLI.	412;
GRIEVE, Mr James, resolution on death of	XXXVII.	435
GRIEVE, Kenneth Campbell, appointed to list of beneficiaries of Argyll Naval Fund	XLII.	420
GUILD, Mr J. Lyon, motion by, regarding foot and mouth disease	XXXVI.	402

H

H.M. THE KING—Address to, on death of Queen Alexandra expresses thanks for address, 444. Illness of	XXXVIII.	440;
H.M. THE QUEEN—Message of sympathy in respect of the King's illness	XLI.	427, 442
H.R.H. THE PRINCE OF WALES— Requested to accept election as an honorary member accedes to request, 403; elected, 421. Visit to Kelso Show	XXXIX.	402;
H.M. QUEEN ALEXANDRA, resolution on death of	XXXVIII.	440
HAIG, Earl, resolution on death of	XL.	411
HANNAH Dairy Research Institute— Application for grant for three years Application for grant for equipment and towards endowment fund Grant of £1500	XLI.	415; refused, 421
HARROW, new cultivating— Particulars of, invented by Major Andrew M'Dowall Request that Society apply for grant from Empire Marketing Board refused	XLII.	417
HAY and pasture experiments, some, by Principal W. G. R. Paterson, B.Sc., N.D.A.(Hons.)	XL.	40
HAY, Mr Athole S.— Appointed Convener of Local Committee for Kelso Show, 1926 Appointed representative to the Association for Preservation of Rural Scotland	XXXVIII.	441
HAY from permanent grass— Total produce, acreage, and yield per acre in each county of Scotland (1922) XXXVI. 251; (1923) XXXVII. 268; (1924) XXXVIII. 289; (1925) XXXIX. 239; (1926) XL. 243; (1927 and 1928) XLI. 263; (1929) XLII. 253.	XLI.	407
HIGH, Lord Provost, invites Society to hold Show of 1930 at Dundee	XLI.	408, 426
HIGHLAND Reel and Strathspey Society— Thanks for use of hall for the forty-seven years of its existence Grant of £30	XLI.	411
	(1929) XLII.	409; confirmed, 428

	Vol.	Page
HOMING Competitions—		
Number of medals awarded (1922-23) XXXVI. 361; (1923-24) XXXVII. 383; (1924-25) XXXVIII. 415; (1925-26) XXXIX. 387; (1926-27) XL. 381; (1927-28) XLI. 392; (1928-29) XLII. 389.		
Regulations for. See Appendix to each volume.		
HOLDINGS, small, by Arthur G. Ruston, B.A., B.Sc.(Lon.), D.Sc. (Leeds)	XXXVIII.	28
HOME Bacon, conference regarding	XXXIX.	405
HOME-FED meat—		
Compulsory use of, at Shows	XXXIX. 419; XL. 394, 415	
HOME pig industry—		
Representatives appointed on a Committee on development of	XXXIX.	406
HOME timber—		
Question regarding supply of, for showyard	XXXIX.	417
Tenders for home timber to receive preference	XXXIX.	420
Suggestion that 75 per cent home timber be used in showyard	XLI.	428
Suggestion not approved	XLII.	422
HONORARY member—		
H.R.H. The Prince of Wales requested to accept election as an	XXXIX. 402; accedes to request, 403; elected, 421	
HONORARY Secretary—		
Death of Mr Charles Douglas, C.B., D.Sc.	XXXVI.	389
Sir Hugh Shaw Stewart, Bart., C.B., nominated as	XXXVII. 398; elected, 417; resigns office, XLI. 415.	
Colonel F. J. Carruthers of Dormont nominated as	XLI. 420; elected, 442	
HOPE, Sir John A., Bart., resolution on death of	XXXVII.	397
HORSES—		
Number of, in each county of Scotland (1923) XXXVI. 252; (1924) XXXVII. 269; (1925) XXXVIII. 290; (1926) XXXIX. 240; (1927) XL. 244; (1928) XLI. 264; (1929) XLII. 254.		
Number imported into Great Britain from Ireland (1923) XXXVI. 258; (1924) XXXVII. 275; (1925) XXXVIII. 296; (1926) XXXIX. 246; (1927) XL. 250; (1928) XLI. 270; (1929) XLII. 260.		
HORSES, grass sickness in, by Dr J. F. Tocher	XXXVI.	65
HORSES—Grass sickness investigation. See "Grass Sickness."		
HOULDSWORTH, Lt.-Col. W. T. R.—		
Nominated to attend conference of representatives of Scottish milk-producing and distributing interests	XXXVI.	383
Appointed representative to a conference regarding proposed National Dairy Council for Scotland	XXXVII. 397, 404	
Appointed representative on Council of Scottish Milk and Health Association	XL.	396
HUNDREDTH Show, 1931—		
Recommended to be held in Edinburgh or Glasgow	XXXIX.	412
Special Committee appointed to consider preliminary arrangements	XLI. 407; report of Committee, 410	
Site offered by Town Council of Perth	XLI. 411, 424	
Deputation from Inverness to be received	XLI.	417
Special Committee recommend Show be held at Perth	XLI.	422
Decision to hold Show at Inverness	XLI.	422
Letter from Caithness Agricultural Society	XLI.	424
Proceedings at General Meeting, January 1929—		
Motion to hold Show at Inverness	XLI. 443-446	
Motion to hold Show at Edinburgh	XLI. 446-447	
Motion to hold Show at Perth	XLI.	447
Decision to hold Show at Edinburgh	XLI.	447
Letter from Provost MacEwen, Inverness, regarding proceedings at General Meeting (January 1929)	XLI.	428
Memorial for Alexander Munro and others, with counsel's opinion thereon	XLI. 429-431	
Views of Society's law agents on memorial and opinion	XLI. 431-433	

	Vol.	Page
MEMBERSHIP SHOW—Continued.		
Directors abide by decision of General Meeting to hold Show in Edinburgh	XLI.	433
Further letter from Provost MacEwen	XLII.	403
Views of Society's law agents XLII. 403; question not to be reopened, 404		
Special Committee reappointed	XLII.	414
Report of Committee	XLII.	425
Additional extraordinary directors to be appointed	XLII.	425
Increase of 50 per cent in prize money for live stock	XLII.	425
Co-operation of Breed Societies requested	XLII.	425
Reports to General Meetings (June 1929) XLII. 429; (Jan. 1930) 434		
HUNTER, Mr James A. H., resolution on death of	XXXVIII.	435
HUNTER, Mr W. C., appointed representative on Joint Committee of British Live-Stock Breeders	XLI.	419
I		
ILL, loupings, by Sir Stewart Stockman, M.R.C.V.S.	XXXVI.	1
IMPLEMENTS—		
Suggestion by Mr Andrew M'Dougall that Society offer prize of £5000 for effective method of reducing costs of cultivation	XXXVI.	
391; remitted to Sub-Committee, 394; suggestion not approved, XXXVII. 410; request that Society apply for grant from Development Commissioners to build an electric tractor, XLI. 418; request refused, 425; request that Society apply for grant from Empire Marketing Board to build new cultivating harrow refused, XLII. 419.		
Mr William Low appointed Convener of Implement Committee	XL.	407
Mr P. O. Turnbull declines Convenership of Implement Committee	XL.	407
Regulations governing award of ploughing medals XLI. 407; regulations revised, 409.		
Turnip topping and tailing machines—Suggested trial of	XL.	415; trial not to be held, XLI. 409.
IMPORT duty on superphosphates to be resisted	XXXVIII.	430
IMPORTATION of German oats—		
Representatives appointed to attend a conference	XLII.	416
IMPORTATION of Pedigree Animals Act, 1925, with regard to—		
Afrikaner Cattle Breeders' Society Herd-book	XL.	404
Corriedale Sheep Flock-book of New Zealand	XXXVIII.	439
Friesland Herd-book of South Africa	XXXVIII.	439
Record of Canadian Swine Breeders' Association (Duroc pigs)	XL.	405
Record of Canadian Swine Breeders' Association (Tamworth pigs)	XXXIX.	402
INFLUENCE of diet on susceptibility to disease, the, by J. B. Orr, D.S.O., M.C., M.A., M.D., D.Sc.	XLII.	28
INFLUENCE on nutrition of sunlight and artificially produced ultra-violet rays, by J. B. Orr, D.S.O., M.C., M.D., &c.; J. M. Henderson, M.A., M.B., D.Sc.; and Arthur Crichton, M.A., B.Sc.	XXXVIII.	88
INGLIS, Mr George C., M.R.C.V.S., appointed veterinary inspector for Alloa Show, 1929	XLI.	425
INSECT and other pests, by Dr R. Stewart MacDougall, M.A., D.Sc., F.R.S.E. (1923) XXXVI. 100; (1924) XXXVII. 167; (1925) XXXVIII. 151; (1926) XXXIX. 131; (1927) XL. 116; (1928) XLI. 137.		
INSPECTION of growing crops of potatoes, reports of conferences regarding	XXXVII.	400; XLII. 413

	Vol.	Page
INSURANCE of woods, fire—Representatives to attend a conference as to	XLII.	413
INTENSIVE cultivation of grassland, notes on, by William Low	XLII.	113
INTERNATIONAL Congress of Entomology— Dr R. Stewart MacDougall to represent Society at Zurich and at Cornell University, XL. 416.	XXXVIII.	433 ; 416.
INTERNATIONAL Dairy Congress— Views of Society invited regarding desirability of holding preliminary conference	XXXVII.	407
Mr John Speir appointed as representative	XXXVII.	408
Mr John M'Craig and Mr W. P. Gilmour to attend special meeting	XXXVII. 414; report of meeting,	XXXVIII. 429
Directors in favour of proposed congress being proceeded with 432.	XXXVIII.	432.
Holding of congress to be reconsidered	XXXVIII.	439
Congress to be held	XXXVIII.	440
Mr W. P. Gilmour to represent Society at a further meeting	XXXVIII.	440
National Farmers' Union withdraws from Provisional Council	XXXIX.	401
Further information desired before giving financial support	XXXIX.	405
Mr W. P. Gilmour appointed representative on Finance Committee	XXXIX.	406
Mr W. P. Gilmour to attend meeting regarding World's Dairy Congress	XL.	393
Draft programme submitted	XL.	413
Request for contribution	XL.	413
Grant of twenty-five guineas	XL.	416
Delegates appointed to attend congress	XL.	416
See also "World's Dairy Congress."		
INTERNATIONAL Institute of Agriculture, Rome— Society in favour of Institute entering into relations with independent agricultural Societies	XXXVIII.	429
Master of Polwarth to represent Society at a joint conference 451; report of, XXXIX. 401.	XXXVIII.	451 ; 401.
Request for representative on Permanent International Com- mission of Agricultural Associations	XXXIX.	410
Colonel F. J. Carruthers appointed as representative	XXXIX. 414; agrees to attend first meeting at Rome, XL. 405; report of meeting, 407.	414 ; 407.
Conference of wheat experts at Rome	XL.	393
INTERNATIONAL Milk Congress, Paris, notice of	XXXVIII.	451
INTERNATIONAL Veterinary Congress, 11th—Representatives ap- pointed to attend	XLII.	413
INVERNESS Show, 1923— Abstract of accounts	XXXVI.	369
Accounts—Probable loss of £2800	XXXVI.	382-399
Alterations in Prize List	XXXVII.	384
Attendants' accommodation for cooking meals	XXXVI.	376, 378
Attendants' boxes—No oil-stoves to be used in	XXXVI.	376
Attending members appointed	XXXVI. 373, 376; list of,	360
Awards, List of	XXXVI.	297
Blackface rams, outwintered class modified	XXXVI. 377; protest against modification, 380.	377 ; 380.
Caterers appointed	XXXVI.	374
Cooking accommodation for attendants' meals	XXXVI.	376, 378
Donation of fifty guineas by Inverness Town Council	XXXVI.	376
Donation of £20 by Nairnshire Farmer Society	XXXVI.	376
General Meeting of members in showyard	XXXVI.	397
Heifers in calf—Interpretation of Rule 33	XXXVI.	377
Highland Club, Inverness—Directors and officials appointed honorary members of, during Show	XXXVI.	376
Highland ponies and Western Island ponies not to be judged at same time	XXXVI.	374
Horse-shoeing Competition—Judges and attending members appointed	XXXVI.	374

	Vol.	Page
INVERNESS Show, 1923—continued.		
Hotel accommodation	XXXVI.	376
Judges, list of	XXXVI.	359
Kinmount Challenge Cup presented to Society	XXXVI.	398
Local Committee appointed	XXXVI.	374
New implements, judges of	XXXVI.	374
Prize money, £3000 drawn from ordinary account to meet	XXXVI.	384
Report of	XXXVI.	266
Reports to General Meetings (June 1923) XXXVI. 396; (July 1923)	XXXVI.	397;
(January 1924), 401.		
Royal (Dick) Veterinary College—Free stand granted	XXXVI.	378
Rural industries, judges of	XXXVI.	374
Timber, question regarding hire of	XXXVI.	400
Votes of thanks	XXXVI.	398
Withdrawal of stock from showyard	XXXVI.	378
INVERNESS Show, 1932. See "Show of 1932."		
INVESTIGATION, Grass Sickness. See "Grass Sickness."		
INVESTIGATION, proposed milk—		
Dr J. F. Tocher requests Society to give grant for a	XL.	409
Dr J. F. Tocher to prepare detailed scheme of investigation	XL.	409
J		
JOINT-COMMITTEE of British Live-stock Breeders—Grant of ten guineas and annual affiliation fee of one guinea	XLI.	419
JOINT-CONFERENCE on agricultural depression. See "Agricultural."		
JOINT evil in foals, navel ill or, by Professor John R. M'Call, M.R.C.V.S., F.R.S.M.	XXXVI.	84
JUDGES, lists of—		
Inverness, 1923	XXXVI.	359
Perth, 1924	XXXVII.	381
Glasgow, 1925	XXXVIII.	413
Kelso, 1926	XXXIX.	385
Edinburgh, 1927	XL.	379
Aberdeen, 1928	XLI.	390
Alloa, 1929	XLII.	387
JUDGING Competitions, Live-stock. See "Live-Stock."		
JUDGING, single—		
Captain John MacGillivray gives notice of motion regarding	XXXIX.	402
Motion submitted and approved	XXXIX.	404
Special Committee appointed	XXXIX.	404
Report of Special Committee	XXXIX.	409, 414
Selection Committee appointed	XXXIX.	409
Draft regulations submitted and approved	XXXIX.	417
Suggestion to discontinue sending out nomination forms not approved	XXXIX.	417
Requests to discontinue not acceded to	XLI.	417, 434, 441
Two judges, acting independently, to be appointed for large classes	XLI.	417
K		
KELSO Show, 1926—		
Abstract of accounts	XXXIX.	394
Ages of cattle—No action taken	XXXVIII.	444, 448
Alterations in Prize List	XL.	382
Attending members appointed	XXXIX.	400, 402; list of, 386
Award List	XXXIX.	290
Ayrshire cows, request to amend Rule 32 for, not granted	XXXVIII.	445
Blighty Industries Association, Ltd.—Free stand	XXXIX.	400
Border Union Agricultural Society—Grant of £250	XXXVIII.	456; XXXIX.
425.		
Caterers appointed	XXXVIII.	445; XXXIX.
		400

	Vol.	Page
KELSO Show—continued.		
Catering Committee	XXXVIII.	437
Children's riding pony classes	XXXVIII.	441
Convener of Local Committee—Mr Athole S. Hay appointed	XXXVIII.	441
Credit balance reported	XXXIX.	408
Date fixed	XXXVIII.	437
Dexter cattle, classes instituted for	XXXVIII. 447; judge for, XXXIX.	400
Edinburgh and East of Scotland College of Agriculture— Grant of free stand	XXXVIII. 437; grant of sheep pens, XXXIX.	400
Entry fees, return of	XXXIX.	406
Forage Committee	XXXVIII.	437
Forestry Exhibition—Grant of £40	XXXVIII.	437
General arrangements	XXXIX.	403
General Strike affects entries	XXXIX.	402
Goats—Milking class deleted	XXXVIII.	441
H.R.H. Prince of Wales to visit Show	XXXVIII. 458; XXXIX. 403, 424; thanks to, 408.	
Harness horse classes	XXXVIII.	441
Horse-shoeing Competition—Judges and attending members	XXXVIII.	448, 451.
Hunters, thirteen classes for	XXXVIII.	441
Judges appointed	XXXVIII. 441; list of, XXXIX.	385
Jumping Competition for hunters	XXXVIII.	445
Large white Ulster pig classes	XXXVIII.	441
Loading bank to be provided by Railway Company	XXXVIII.	454
Local Committee appointed	XXXIX.	400
Meeting of members in showyard	XXXIX.	424
New implements—Judges appointed	XXXVIII. 451; to be judged on Monday before Show, XXXVIII.	451.
Poultry classes	XXXVIII. 441, 445, 448	
Prize List and Regulations	XXXVIII. 427, 441, 451; Appendix 79	
Rabbits, closing date for entries	XXXVIII. 441; judge of, 448, 451	
Renfrewshire Gold Cup offered to best group half-bred sheep	XXXVIII.	441
Report of	XXXIX.	254
Reports to General Meetings (June 1925)	XXXVIII. 454; (January 1926) 458; (June 1926) XXXIX. 422; (July 1926) 424; (January 1927) XXXIX. 427.	
Rule 32, request to amend, for Ayrshire cows not granted	XXXVIII.	445
Rural industries—Judges appointed	XXXVIII.	448, 451
Shepherd's pack sheep classes	XXXVIII.	441, 445
Show Contracts Committee	XXXVIII.	437
Show fixed to be held at Kelso	XXXVIII.	429
Special prizes	XXXVIII. 437, 441, 445, 448, 451	
Stand rents reduced	XXXVIII.	448
Stewards appointed	XXXVIII.	445
Storm at Show	XXXIX.	408
Timber contract	XXXVIII.	448
Times of judging	XXXVIII.	441
Town and district of Kelso give donation of £350	XXXVIII.	458
Veterinary inspector—Mr A. B. Tully, M.R.C.V.S., appointed	XXXVIII.	445
Votes of thanks	XXXIX.	424-426
See also "Show of 1926."		
KERR, Mr J. E., of Harviestoun—		
Nominated Vice-President in room of Mr J. J. Moubray (deceased)	XLI.	420; elected, 442
Appointed Convener of Local Committee for Alloa Show, 1929	XLI.	421
Appointed to attend joint conference regarding agricultural depression	XLII.	426
Appointed Trustee of Royal (Dick) Veterinary College Con- tinental Post-Graduate Fellowship	XLII.	421
Elected Chairman of the Board of Directors	XLII.	410
KEYS, Charles Edward, appointed beneficiary of Argyll Naval Fund	XXXIX.	402
KING, H.M. The, address to, on death of Queen Alexandra	XXXVIII.	440;
thanks to directors for address, 444.		
Illness of	XLI.	427, 442

	Vol.	Page
KINMOUNT Challenge Cup presented to Society	XXXVI.	398
KIPPEN, Mr William J., of Westerton, resolution on death of	XLI.	419
KIRK, Mr Thomas—		
Appointed representative on deputation to Home Secretary regarding summer time	XXXVI.	386
Unable to attend with joint deputation	XXXVI.	394
Resolution on death of	XXXVII.	413
L		
LADY members' pavilion—		
Reserved for use of lady members	XL.	412
Additional tickets for	XL.	412
'LAMB dysentery,' by W. A. Pool	XLI.	47
LAND problems, some grass, by Professor J. A. Scott Watson, B.Sc.	XXXVI.	25
LAND Settlement in Scotland, Committee on, representatives to give evidence before	XL.	401
LANDED Property Practitioners (Registration) Bill—		
Passing of Bill to be opposed	XXXVI.	375
Report of joint meeting with various bodies	XXXVI.	376
LANDOWNER, utilisation and conversion of timber from the point of view of the small, by J. H. Milne Home, F.H.A.S.	XL.	23
LARBERT, Show of 1929 not to be held at	XLI.	406
LAUDER, Mr James P., appointed officer and caretaker	XLII.	409
LAW and Parliamentary Committee—		
Landed Property Practitioners (Registration) Bill	XXXVI.	375
Report of Joint Meeting with various bodies	XXXVI.	376
LEITCH, Mr Andrew B., resolution on death of	XXXVII.	401*
LICENSING of bulls—		
Joint-Committee of Shorthorn Breeders' representation to be supported	XL.	414
Legislative authority required for scheme	XLI.	405
Further representation to Ministry of Agriculture	XLI.	422
LINDSAY, Mr James, M.R.C.V.S., appointed veterinary inspector for Dumfries Show, 1930	XLII.	419
LIVE-STOCK—		
Exportation of. See "Exportation."		
Importation of. See "Importation."		
Number of, in each county in Scotland. See "Cattle," "Horses," "Sheep," and "Pigs."		
LIVE-STOCK Breeders, Joint-Committee of British—		
Grant of ten guineas and annual affiliation fee of one guinea	XLI.	419
LIVE-STOCK breeding, genetics in relation to, by F. A. E. Crew, M.D., D.Sc., Ph.D., &c.	XXXVII.	146
LIVE Stock Judging Competition—		
Regulations for	XXXIX.	417
Additional regulations	XXXIX.	419
Regulations revised	XL.	412
Age limit of competitors reduced	XLII.	415
LONG service certificates and medals—		
Not to be granted for service outside Scotland	XXXVI.	388
Decision adhered to	XXXVII.	402
Question raised regarding refusal of award to applicant in Ireland	XXXVII.	422
Committee appointed to reconsider award of	XXXVIII.	451
Gold medal and special certificate to be given for service of forty-five years and over	XL.	395, 397
For conditions of award, see Appendix to each volume.		
Certificates and medals awarded (1922-23) XXXVI. 361; (1923-24) XXXVII. 383; (1924-25) XXXVIII. 415; (1925-26) XXXIX. 387; (1926-27) XL. 381; (1927-28) XLI. 392; (1928-29) XLII. 389.		

	Vol.	Page
Lord High Commissioner—Official visit of Earl of Elgin and Kincardine, C.M.G., to General Meeting	XXXIX.	421
LOUPING-ILL, by Sir Stewart Stockman, M.R.C.V.S.	XXXVI.	1
Low, Mr William, appointed Convener of Implements Committee	XL.	407
Mc		
M'ALPINE, Professor A. N., botanist, resolution on death of	XXXVII.	408
M'CAIG, John—		
Appointed on Committee to attend conference regarding proposed National Dairy Council for Scotland	XXXVII.	397, 404
To attend conference on agricultural policy	XXXVII.	406
To attend meeting regarding proposed International Dairy Congress	XXXVII.	414
Resolution on death of	XXXVIII.	435
M'CALL, Professor John R., M.R.C.V.S., appointed veterinary inspector for Glasgow Show, 1925	XXXVII.	408
M'CLEAN, Mr James, nominated as an ordinary director in room of Mr John M'Caig (deceased)	XXXVIII.	440; elected, 457
MACDONALD, Mr J. Huntly, resolution on death of	XXXIX.	407
MACDOUGALL, Dr R. Stewart—		
Appointed representative at International Congress of Entomology at Cornell University	XL.	416
Agrees to represent Society at congress of Entomology at Zurich	XXXVIII.	433
Report to General Meeting (June 1923) regarding wheat bulb fly, Colorado beetle, and warble fly	XXXVI.	397
M'DOWALL, Mr Andrew—		
Proposes that Society offer prize of £5000 for method of reducing costs of cultivation	XXXVI.	391, 394; proposal not entertained, XXXVII. 410.
Requests Society to apply for grant from Development Commissioners	XLI.	418; request not acceded to, 425
Letter from Department of Agriculture regarding new cultivating harrow invented by	XLII.	417; Society not to apply to Empire Marketing Board for grant to build harrow, 419.
M'GEE, Mr Robert, nominated as an extraordinary director	XLI.	420; elected, 442.
MACGILLIVRAY, Captain John—		
Gives notice of motion regarding adoption of system of single judging	XXXIX.	402
Submits motion	XXXIX.	404
See also "Single Judging."		
M'INTYRE, Mr Peter, to attend meeting regarding damage by deer	XLI.	422; XLII. 411, 423.
MACKENZIE, Sir Kenneth J., of Gairloch, Bart., resolution on death of	XLII.	417
MACLACHLAN of MacLachlan—		
Appointed Convener of Argyll Naval Fund Committee	XXXVIII.	448
M'LAREN, Mr Duncan, resolution on death of	XXXIX.	419
M'LAREN, Mr James, Cornton—		
Appointed to attend joint conference regarding agricultural depression	XLII.	426
Elected chairman of the Board of Directors	XL.	402; re-elected, XLI. 414.
Submits scheme for encouragement of breeding of good commercial cattle	XL.	413
Scheme remitted to Special Committee	XL.	413
Scheme postponed	XLI.	422
To attend conference regarding proposed Sheep (General Double Dipping) Order, 1925	XXXVIII.	448

	Vol.	Page
M'LAREN, Mr J. T.—		
Elected chairman of the Board of Directors	XXXVI.	381; re-elected, XXXVII. 402.
Represents Society at a conference on proposed standard tables of unexhausted values	XXXVII.	410, 412
Appointed to attend meeting as to formation of a Wild White Clover Growers' Association	XXXIX.	401
Representative to a conference on home bacon supplies	XXXIX.	405
Representative on a Committee on home pig production	XXXIX.	406
Appointed Convener of Local Committee for Edinburgh Show, 1927	XXXIX.	411
MACLEAN, Hector Charles Donald, appointed beneficiary of Argyll Naval Fund	XL.	400
MACMILLAN, Mr Robert, to attend meeting regarding damage by deer	XLI.	422; XLII. 411
MACNEILAGE, Mr Archibald—		
Information desired regarding outstanding Show accounts	XXXVII.	422
Raises question as to long service award refused to applicant in Ireland	XXXVII.	422
Raises questions regarding new premises	XLII.	435
M'QUEEN, Mr James, to attend conference regarding Sheep (General Double Dipping) Order, 1925	XXXVIII.	448
M		
MACHINERY trials. See "Implements Committee."		
MACHINES, turnip topping and tailing, suggested trial of, and grant of medals	XL.	415
Trial not to be held	XLI.	409
MAITLAND, Miss A. T.—Salary increased	XXXIX.	412; XLII. 414
MAN and animals, diseases common to, by D. S. Rabagliati, O.B.E., B.Sc., F.R.C.V.S., D.V.S.M.	XXXIX.	97
MANAGEMENT, scientific farm, by James Wyllie, B.Sc., N.D.A. (Hons.), N.D.D.	XXXVII.	104
MANAGEMENT, some problems in farm, by James Wyllie, B.Sc., N.D.A.(Hons.), N.D.D.	XLI.	21
MANGOLDS—		
Acreage in each county in Scotland (1923) XXXVI. 247; (1924) XXXVII. 264; (1925) XXXVIII. 284; (1926) XXXIX. 234; (1927) XL. 238; (1928) XLI. 257; (1929) XLII. 247.		
Total produce, acreage, and average yield per acre in each county (1922) XXXVI. 250; (1923) XXXVII. 267; (1924) XXXVIII. 287; (1925) XXXIX. 237; (1926) XL. 241; (1927 and 1928) XLI. 261; (1929) XLII. 251.		
MANURES, instructions for valuing. See Appendix to each volume.		
MANURING, feeding <i>versus</i>, for beef production during the grazing season, by Principal W. G. R. Paterson, B.Sc., N.D.A. (Hons.)	XXXIX.	60
MANURING of crops in Dumfries and Galloway, by John Gillies, N.D.A., N.D.D.	XLII.	152
MAR and Kellie, The Earl of, K.T., elected President of the Society (1928-29)	XLI.	435
MARGARINE, quantity and value of, imported into United Kingdom (1923) XXXVI. 257; (1924) XXXVII. 274; (1925) XXXVIII. 295; (1926) XXXIX. 245; (1927) XL. 249; (1928) XLI. 269; (1929) XLII. 259.		

	Vol.	Page
MARKETING Board, potato. See "Potato."		
MARKING of beef and flour, grading and, Society to support scheme regarding	XLII.	416
MARTIN , Mr John M., resolution on death of	XXXVI.	380
MEAL , quantity and value of, imported into United Kingdom (1923) XXXVI. 253; (1924) XXXVII. 270; (1925) XXXVIII. 291; (1926) XXXIX. 241; (1927) XL. 246; (1928) XLI. 265; (1929) XLII. 255		
MEAT , home-fed, compulsory use of, at Shows	XXXIX.	419; XL. 394, 415
MEAT , quantity and value of, imported into United Kingdom (1923) XXXVI. 254; (1924) XXXVII. 271; (1925) XXXVIII. 292; (1926) XXXIX. 242; (1927) XL. 246; (1928) XLI. 266; (1929) XLII. 256.		
(Dead), quantity and value of imported into United Kingdom (1923) XXXVI. 256; (1924) XXXVII. 273; (1925) XXXVIII. 294; (1926) XXXIX. 244; (1927) XL. 248; (1928) XLI. 268; (1929) XLII. 258.		
MEETING , suggested change of hour of Board	XLI.	410; date changed, XXXVI. 390; XLII. 423.
MEIKLEM , Mr William, presents gold cup for Clydesdale geldings	XLII.	412
MELLIS , David Barclay Nairne, appointed to list of beneficiaries of Argyll Naval Fund	XLII.	420
MEMBER , honorary— H.R.H. Prince of Wales requested to accept election as accedes to request, 403; elected, 421	XXXIX.	402;
MEMBERS — Analyses for. See "Analyses." Additional lists of. See Appendix (1924) XXXVI. 113; (1926) XXXVIII. 129; (1928) XL. 124. Complete list of, end of volume	XXXIX.	(1927)
METEOROLOGY of Scotland. See "Weather."		
MILAN Fair, date of	XXXVI.	381
MILK and Health Association, Scottish National— Grant of £100 (1925) XXXVIII. 434; confirmed, 455 Application for grant for 1927 XL. 396 Grant of £100 (1927) XL. 398; confirmed, 400, 418 Grant of £50 (1928) XLI. 407; confirmed, 409, 436 Grant of £50 (1929) XLII. 409; confirmed, 428 Representatives appointed on XL. 396, 398; XLI. 407		
MILK , circumstances influencing the yield and quality of, by James Mackintosh, O.B.E., N.D.A., &c.	XXXVII.	126
MILK Congress, Paris, International, notice of	XXXVIII.	451
(MILK Distributive) Order, Trade Boards—Copy of notice submitted	XLI.	405
MILK fever, by Professor J. Russell Greig	XLI.	115
MILK fever, investigation into—Grant of £50 to Royal (Dick) Veterinary College	XLI.	419
MILK investigation— Dr J. F. Tocher requests grant towards cost of a Dr J. F. Tocher to prepare detailed scheme of investigation	XL.	409 XL. 409
MILK producing and distributing interests, conference on Scottish	XXXVI.	383
MILK production, feeding for, by Andrew C. M'Candlish, Ph.D., M.S.A., B.Sc.(Agric.), N.D.A., N.D.D.	XXXVIII.	55
MILK records, by William Stevenson, B.Sc., N.D.A., N.D.D. (1923) XXXVI. 185; (1924) XXXVII. 194; (1925) XXXVIII. 216; (1926) XXXIX. 166; (1927) XL. 165; (1928) XLI. 196; (1929) XLII. 187,		

	Vol.	Page
MILK , the chemical and physiological properties of, and their bearing on problems of the dairy industry, by J. B. Orr, D.S.O., M.C., M.A., M.D., D.Sc.	XXXVI.	40
MODEL dairy bye-laws—		
Directors unable to give observations within time specified	XXXVIII.	439
MONTGOMERIE , Mr A. W., appointed representative to a joint meeting regarding warble fly pest	XXXVIII.	433
MONTROSE , The Duke of, resolution on death of	XXXVIII.	444
MOUBRAY , Mr J. J., resolution on death of	XLI.	414
MUNRO , Mr Alexander—		
Appointed delegate to World's Dairy Congress	XL.	416
Appointed to attend joint conference on agricultural depression	XLII.	426
MURDOCH , Mr Alexander—		
Appointed to attend meeting regarding proposed National Dairy Council for Scotland	XXXVII.	404
Appointed representative on Council of Scottish National Milk and Health Association	XLI.	407
Appointed to attend 11th International Veterinary Congress	XLII.	413
Thanks to, for Volumes II. and III. of 'Transactions'	XXXVII.	400
MURRAY , Mr R. G., Spittal, resolution on death of	XXXVIII.	435
N		
NASMYTH , Dr T. G.—		
Nominated as a director in room of Sir John A. Hope, Bart. (deceased)	XXXVII.	406; elected, 421
Appointed to attend conference on supplies of home bacon	XXXIX.	405
Appointed representative on an Edinburgh Regional Survey Committee	XXXIX.	408
Submits motion that a Committee be appointed to look out for new premises	XL.	413
Appointed to attend 11th International Veterinary Congress	XLII.	413
NATIONAL Dairy Council for Scotland—		
Letter from Board of Agriculture remitted to Special Committee	XXXVI.	391
Report of Special Committee	XXXVI.	394
Representatives appointed to attend conference	XXXVII.	397
Report of conference	XXXVII.	400
Mr John Speir to represent Society on Provisional Council	XXXVII.	404
Committee appointed to attend meeting in Glasgow	XXXVII.	404
NATIONAL Diploma in Agriculture—		
Reports on examinations (1923) XXXVI. 396; (1924) XXXVII. 418; (1925) XXXVIII. 455; (1926) XXXIX. 423; (1927) XL. 418; (1928) XLI. 437; (1929) XLII. 429.		
Syllabus of examination. See Appendix to each volume (1924) XXXVI. 16; (1925) XXXVII. 14; (1926) XXXVIII. 14; (1927) XXXIX. 14; (1928) XL. 14; (1929) XLI. 14; (1930) XLII. 14.		
Winners of diplomas. See Appendix to each volume (1923) XXXVI. 20; (1924) XXXVII. 20; (1925) XXXVIII. 21; (1926) XXXIX. 21; (1927) XL. 21; (1928) XLI. 21; (1929) XLII. 21.		
Questions raised by Emeritus Professor Wallace regarding examinations	XXXVI.	401
Joint letter from Sir Daniel Hall and Sir Robert Greig regarding post-graduate courses	XXXVIII.	434; report of Education Committee, 442.
Mr Harry Armour gives notice of motion regarding examination	XXXIX.	420; motion submitted, XL. 395; report of Education Committee, 397.
Report of Education Committee regarding resolution passed at conference of principals of agricultural colleges	XL.	397
Information to be obtained from Scottish Education Authorities	XL.	398

	Vol.	Page
NATIONAL Diploma in Dairying—		
Reports of examinations (1923) XXXVI. 404; (1924) XXXVII. 426; (1925) XXXVIII. 459; (1926) XXXIX. 428; (1927) XL. 424; (1928) XLI. 437, 448; (1929) XLII. 434.		
Syllabus of examination. See Appendix to each volume (1924) XXXVI. 30; (1925) XXXVII. 30; (1926) XXXVIII. 34; (1927) XXXIX. 31; (1928) XL. 31; (1929) XLI. 31; (1930) XLII. 31.		
Winners of diplomas. See Appendix to each volume (1923) XXXVI. 34; (1924) XXXVII. 34; (1925) XXXVIII. 38; (1926) XXXIX. 35; (1927) XL. 37; (1928) XLI. 38; (1929) XLII. 38.		
New syllabus	XL.	Appendix 31
Amalgamation of examinations for National Diploma in Dairying and for the Dairy Diploma of the British Dairy Farmers' Association	XLI.	412, 437
NATIONAL mark potatoes, display of	XLII.	426
NATIONAL Milk Publicity Council—		
Attention drawn to work of	XXXVI.	381
NAVEL ill or joint evil in foals, by Professor John R. M'Call, M.R.C.V.S., F.R.S.M.	XXXVI.	84
NEW cultivating harrow. See "Harrow."		
NEW implement awards (1923) XXXVI. 358; (1924) XXXVII. 380; (1925) XXXVIII. 412; (1926) XXXIX. 384; (1927) XL. 378; (1928) XLI. 389; (1929) XLII. 386, 404.		
NEW members. See Appendix.		
NEW premises. See "Premises."		
NEW Zealand, Empire farmers from, to visit Dumfries Show, 1930	XLII.	410
NICHOLSON, Mr A. B., Glenberrie, resolution on death of	XXXVI.	393
NOMINATION of directors by Show Districts. See "Directors."		
NORTHUMBERLAND Agricultural Society—		
Thanks to directors for consideration as to date fixed for Kelso Show	XXXVIII.	447
NOTES on intensive cultivation of grassland, by William Low	XLII.	113
NUTRITION, influence on, of sunlight and artificially produced ultra-violet rays, by J. B. Orr, D.S.O., M.C., M.D., &c.; J. M. Henderson, M.A., M.B., D.Sc.; and Arthur Crichton, M.A., B.Sc.	XXXVIII.	88
NUTRITION of the pig, review of recent work on the, by J. B. Orr, D.S.O., M.C., M.A., M.D., &c.; and Arthur Crichton, M.A., B.Sc.	XXXIX.	25
O		
OATS—		
Acreage in each county of Scotland (1923) XXXVI. 247; (1924) XXXVII. 264; (1925) XXXVIII. 284; (1926) XXXIX. 234; (1927) XL. 238; (1928) XLI. 257; (1929) XLII. 247.		
Price of home-grown, in the Edinburgh Market (1923) XXXVI. 259; (1924) XXXVII. 276; (1925) XXXVIII. 297; (1926) XXXIX. 247; (1927) XL. 251; (1928) XLI. 271; (1929) XLII. 261.		
Total produce, acreage, and average yield per acre (1922) XXXVI. 248; (1923) XXXVII. 265; (1924) XXXVIII. 285; (1925) XXXIX. 235; (1926) XL. 239; (1927 and 1928) XLI. 259; (1929) XLII. 249.		
OATS, Gorman, importation of—Representatives appointed to attend a conference regarding	XLII.	416
OFFICE-BEARERS and directors of the Society. See "Directors."		
OFFICER and caretaker. See "Caretaker."		
ORDER, 1925, proposed Sheep (General Double Dipping)—		
Directors do not agree to its adoption	XXXVIII.	438
Representatives to attend conference	XXXVIII.	448

	P	Vol.	Page
PARK, Mr Robert , appointed to attend conference regarding German oats		XLII.	416
PASTURE—			
Permanent, acreage in each county of Scotland (1923) XXXVI. 247; (1924) XXXVII. 264; (1925) XXXVIII. 284; (1926) XXXIX. 234; (1927) XL. 238; (1928) XLI. 257; (1929) XLII. 247.			
Permanent, total produce, and average yield per acre (1922) XXXVI. 251; (1923) XXXVII. 268; (1924) XXXVIII. 288; (1925) XXXIX. 239; (1926) XL. 242; (1927 and 1928) XLI. 262; (1929) XLII. 252.			
PASTURE experiments, some hay and, by Principal W. G. R. Paterson, B.Sc., N.D.A.(Hons.)		XL.	40
PASTURE , the relation of the chemical composition of, to its feeding value, by J. B. Orr, D.S.O., M.C., M.D., M.B., D.Sc.		XLI.	99
PATRICK Bell and the centenary of the reaping machine, by Professor James Hendrick, B.Sc., F.I.C.		XL.	51
PAXTON, Sir Thomas, Bart., LL.D. , appointed Convener of Local Committee for Glasgow Show, 1925		XXXVII.	406
PEAS—Acreage in each county of Scotland (1923) XXXVI. 247; (1924) XXXVII. 264; (1925) XXXVIII. 284; (1926) XXXIX. 234; (1927) XL. 238; (1928) XLI. 257; (1929) XLII. 247.			
PEDIGREE Animals Act, 1925, Importation of, with regard to—			
Afrikaner Cattle Breeders' Society Herd-book		XL.	404
Corriedale Sheep Flock-book of New Zealand		XXXVIII.	439
Friesland Herd-book of South Africa		XXXVIII.	439
Record of Canadian Swine Breeders' Association (Tamworth pigs)		XXIX.	402; (Duroc Jersey pigs), XL. 405
PEDIGREE stock, restrictions on exportation of Scottish—			
Representation to be made to colonies		XXXVIII.	438
Letters from colonies		XXXVIII.	443
Report of deputation's negotiations with colonies		XXXVIII.	445
Canadian Government not to take risk of Scottish importation		XXXVIII.	447
Direct shipment from Scotland to Australia		XXXIX. 399, 401; XL. 393; XLI. 434.	
PEEBLES—			
Fixed as site for Show of 1926		XXXVII.	404
Town Council offer £1000		XXXVII.	404
Report to General Meeting (Jan. 1924)		XXXVI.	401
Report to General Meeting (June 1924)		XXXVII.	417
Report to General Meeting (Jan. 1925)		XXXVII.	423
Report to General Meeting (Jan. 1925) not adopted		XXXVII.	425
Site of Show of 1926 to be reconsidered		XXXVII. 412, 425	
Site withdrawn		XXXVII.	415
Notice of motion to rescind decision to hold Show at Peebles		XXXVII.	415
Motion submitted and adopted		XXXVIII.	429
Show fixed to be held at Kelso		XXXVIII.	429
See also under "Show of 1926" and "Kelso."			
PERMANENT International Commission of Agricultural Associations—			
Appointment of representative deferred		XXXIX. 410; Colonel F. J. Carruthers of Dormont appointed as representative, 414; agrees to attend first meeting at Rome, XL. 405; report of meeting, 407.	
See also "International Institute."			
PERPETUAL Gold Challenge Cups—			
Suggestion that winners names be engraved on		XXXIX.	416
Names to be engraved on plates attached to plinths		XXXIX.	419
PETER Show, 1924—			
Abstract of accounts		XXXVII.	390
Alterations in Prize List		XXXVIII.	416
Animal Breeding Research Department—Free site		XXXVI.	393
Attending members appointed		XXXVII. 395, 398; list of, 382	

	Vol.	Page
PERTH Show—continued.		
Awards, List of	XXXVII.	315
Belted Galloway heifer classes	XXXVI.	385
British Friesian cattle classes increased	XXXVI. 385,	387
Caterers appointed	XXXVII.	396
Catering Committee	XXXVI.	382
Convener of Local Committee	XXXVI.	385
Cooking by attendants in showyard	XXXVII.	398
Credit balance	XXXVII.	402
Date of Show fixed	XXXVI.	382
Directors not to be attending members on stock in which they are interested	XXXVII.	398
Donation of £100 by Perth Town Council	XXXVI.	378
Donation of 10 guineas to Perth District St Andrew's Ambulance Association	XXXVII.	401
Dorset Horn sheep, classes instituted for	XXXVI. 385,	388
Dun Galloways eligible for Galloway classes	XXXVI.	388
Entries, substitution of, after date of closing	XXXVI.	385
"Extra Stock," Rule 35 to apply to	XXXVII.	398
Foot and Mouth Disease—Stock to be sent to Show on licence	XXXVII.	399
Forage Committee	XXXVI.	382
Forestry Exhibition—Grant of £20	XXXVI.	382
Free stands	XXXVI.	391
General arrangements, report on	XXXVII.	399
General Meeting of members in showyard	XXXVII.	420
Hackneys under 14 hands—Prize money increased	XXXVI.	393
Horse-shoeing judges and attending members	XXXVI. 391,	393
Hunters, six classes for	XXXVI.	385
Judges appointed XXXVI. 385; list of, XXXVII.		381
Judges of new implements	XXXVI.	393
Late evening	XXXVI.	385
Local Committee appointed	XXXVII.	396
New jumps to be provided	XXXVI.	388
Outstanding accounts—Question raised at General Meeting	XXXVII.	422
Perth Town Council—Grant of free space to	XXXVI.	388
Prize List and Regulations XXXVI. 382, 385; Appendix 67		
Prize List and Regulations approved	XXXVI.	393
Red Poll cattle—Increased classification	XXXVI.	385
Report of	XXXVII.	283
Report of Shows Committee	XXXVI.	385
Reports to General Meetings (June 1923) XXXVI. 396; (Jan. 1924) 401; (June 1924) XXXVII. 417; (July 1924) 420; (Jan. 1925) 422.		
Royal (Dick) Veterinary College, free stand to	XXXVII.	396
Rural industries—Judges, &c. XXXVI. 391; XXXVII.		396
Scottish War Savings Committee, free stand to	XXXVII.	396
Show Contracts Committee	XXXVI.	382
Silver medal awarded to now implement after trial	XXXVIII.	428
Special prizes XXXVI. 382, 385, 388, 391, 393; XXXVII.		396
Stewards appointed	XXXVI.	387
Substitution of entries after closing date	XXXVI.	385
Timber contract to be advertised	XXXVI.	385
Timber contract fixed	XXXVI.	387
Veterinary inspector, Mr John Brown, M.R.C.V.S., appointed	XXXVI.	387
Votes of thanks XXXVII. 420-421		
Western Island ponies maximum height reduced	XXXVI.	385
PERTH TOWN Council offer site for Hundredth Show	XLI.	411, 424
PESTS, insect and other, by Dr R. Stewart MacDougall, M.A., D.Sc. (1923)	XXXVI.	100; (1924) XXXVII. 167; (1925) XXXVIII. 161;
(1926) XXXIX. 131; (1927) XL. 116; (1928) XLI. 137.		
PHARMACY Acts, 1908, Poisons and—		
Resolution regarding arsenical sheep dips being included in the	XXXVIII.	431, 434.
Report of conference with Board of Agriculture	XXXIX.	410
Fig, the dentition of the, by Principal O. Charnock Bradley,		
M.D., D.Sc., M.R.C.V.S.	XLII.	51

	Vol.	Page
Pigs, dentition of the—		
Dentition test at Shows not to be imposed	XXXIX.	411 ; XLII. 415
Request for grant towards cost of investigation	XL.	404
Grant of £20 to Royal (Dick) Veterinary College	XL.	407
Interim report of investigation	XLII.	417
Pigs feeding and cattle feeding experiments, by Principal W. G. R. Paterson, B.Sc., N.D.A.(Hons.)	XXXVI.	116
Pigs feeding (indoor <i>versus</i> outdoor fattening), by Principal W. G. R. Paterson, B.Sc., N.D.A.(Hons.)	XXXVII.	86
Pigs industry, home—		
Representatives appointed on a committee on development of	XXXIX.	406
Pigs problems, by Theo. A. Stephens	XXXIX.	74
Pigs production in Scotland, commercial, by Alexander Calder, Ph.D., B.Sc.	XLII.	118
Pigs, review of recent work on the nutrition of the, by J. B. Orr, D.S.O., M.C., M.A., M.D., etc., and Arthur Crichton, M.A., B.Sc.	XXXIX.	25
Pigs—		
Number of, in each county of Scotland (1923) XXXVI. 252 ; (1924) XXXVII. 269 ; (1925) XXXVIII. 290 ; (1926) XXXIX. 240 ; (1927) XL. 244 ; (1928) XLI. 264 ; (1929) XLII. 254.		
Number of, imported into Great Britain from Ireland (1923) XXXVI. 258 ; (1924) XXXVII. 275 ; (1925) XXXVIII. 296 ; (1926) XXXIX. 246 ; (1927) XL. 250 ; (1928) XLI. 270 ; (1929) XLII. 260.		
Number and value of, imported into the United Kingdom (1923) XXXVI. 258 ; (1924) XXXVII. 275 ; (1925) XXXVIII. 296 ; (1926) XXXIX. 246 ; (1927) XL. 250 ; (1928) XLI. 270 ; (1929) XLII. 260.		
PIEBRIGHT cattle-testing station to be closed	XXXVI.	375, 388
PLANTS, choice of varieties and stocks of crop, by Professor J. A. Scott Watson, B.Sc.	XXXVII.	55
PLOUGHING Competitions—		
Improved type of medal to be awarded	XXXVIII.	444
Number of medals awarded (1922-23) XXXVI. 361 ; (1923-24) XXXVII. 383 ; (1924-25) XXXVIII. 415 ; (1925-26) XXXIX. 387 ; (1926-27) XL. 381 ; (1927-28) XLI. 392 ; (1928-29) XLII. 389.		
Regulations to be revised	XLI.	407
Regulations revised	XLI.	409
Regulations for. See Appendix to each volume.		
POINTS about soil fertility, some, by Professor James Hendrick, B.Sc., F.I.C.	XXXVIII.	195
POISONS and Pharmacy Acts, 1908—		
Resolution regarding arsenical sheep dips being included in the	XXXVIII.	431, 434
Report of conference with Board of Agriculture	XXXIX.	410
POLWARTH, the Master of—		
To attend conference regarding relationship with International Institute of Agriculture	XXXVIII.	451 ; gives report of conference, XXXIX. 401.
To attend conference regarding importation of German oats	XLII.	416
POOLE, Bailie William, appointed to attend meeting regarding railway freights	XLI.	411
POPULAR fallacies in farming economics, some, by James Wyllie, B.Sc., N.D.A.(Hons.), N.D.D.	XXXIX.	1
POTATO culture, conference on	XXXVII.	399
POTATO Marketing Board—Request for donation remitted to Finance Committee	XLII.	418 ; no action taken, 423

POTATOES—

Acres in each county of Scotland (1923) XXXVI. 247; (1924) XXXVII. 264; (1925) XXXVIII. 284; (1926) XXXIX. 234; (1927) XL. 238; (1928) XLI. 257; (1929) XLII. 247.
Total produce, acres, and average yield per acre (1922) XXXVI. 249; (1923) XXXVII. 266; (1924) XXXVIII. 286; (1925) XXXIX. 236; (1926) XL. 240; (1927 and 1928) XLI. 260; (1929) XLII. 250.

POTATOES, conditions relating to export of XXXVI. 381

POTATOES in stock feeding, by J. K. Thompson, N.D.A. . . . XLII. 128

POTATOES, inspection of growing crops of—

Report of conference regarding "wildings" and "bolters" . . . XXXVII. 400
Conference regarding amendments to scheme for XLII. 413

POTATOES, national mark, display of XLII. 426

POTATOES, wart disease in, report of conference regarding, . . . XXXVI. 379

POULTRY farming, fourteen years' successful, by Arthur G. Ruston, B.A., D.Sc., and C. V. Dawe, M.Com. XL. 70

POULTRY on the farm, by Miss Agnes Kinross, N.D.D. . . . XXXVIII. 120

PREMISES, new—

Committee appointed to inspect site at 100 Princes Street, Edinburgh XXXVI. 377
Committee appointed to look out for new premises XL. 413
8 Eglinton Crescent, Edinburgh, to be purchased XL. 416
Purchase completed XLI. 407
Committee appointed to consider as to furnishings, &c. . . . XLI. 413
Directors to inspect premises XLI. 418
Lift not to be installed XLI. 423
Painter work—Estimate accepted XLII. 404
Electric lighting—Estimate accepted XLII. 404
Notice of motion to rescind decision that lift be not installed motion submitted and agreed to, 406.
Offer by Town Council of Edinburgh for old premises at 3 George IV. Bridge accepted XLII. 423
Questions raised at General Meeting XLII. 435
Reports to General Meetings (June 1928) XLI. 438; (Jan. 1930) XLII. 435

PRENTICE, Mr John W.—

Appointed delegate to World's Dairy Congress XL. 416

PRESERVATION of Rural Scotland, Association for—

Mr Athole S. Hay to represent Society on the XLI. 407
Subscription of two guineas XLI. 407

PRESIDENTS of the Society—

The Duke of Atholl, K.T., C.B., M.V.O., D.S.O., elected June 1923 XXXVI. 395
The Lord Blythswood, K.C.V.O., elected June 1924 XXXVII. 416
The Duke of Roxburghe, K.T., M.V.O., elected June 1925 . . XXXVIII. 453
The Earl of Wemyss and March, elected June 1926 XXXIX. 421
The Duke of Richmond and Gordon, K.G. elected June 1927 . XL. 417; death of, 411.
The Marquess of Aberdeen and Temair appointed in room of the Duke of Richmond and Gordon, K.G. XL. 413
The Earl of Mar and Kellie, K.T., elected June 1928 XLI. 435
The Duke of Buccleuch and Queensberry, K.T., elected June 1930 XLII. 427

PRICE of a feeding-stuff, no action taken regarding complaint of . XXXVIII. 431

PRICES of home-grown wheat, barley, and oats in Edinburgh Market (1923) XXXVI. 259; (1924) XXXVII. 276; (1925) XXXVIII. 297; (1926) XXXIX. 247; (1927) XL. 251; (1928) XLI. 271; (1929) XLII. 261.

	Vol.	Page
PRICES of sheep and wool since 1818 (1923) XXXVI. 260; (1924) XXXVII. 277; (1925) XXXVIII. 298; (1926) XXXIX. 248; (1927) XL. 252; (1928) XLI. 272; (1929) XLII. 262.		
PRINCE OF WALES, H.R.H. The—		
Requested to accept election as honorary member	XXXIX.	402; accedes to request, 403; elected, 421.
Visit to Kelso Show	XXXVIII. 458; XXXIX. 403, 424; thanks to,	408
PROBLEMS in farm management, some, by James Wyllie, B.Sc., N.D.A.(Hons.), N.D.D.	XLI.	21
PROBLEMS, pig, by Theo. A. Stephens	XXXIX.	74
PROBLEMS, some grass land, by Professor J. A. Scott Watson, B.Sc.	XXXVI.	25
PROCEEDINGS at Board and General Meetings (1923) XXXVI. 373; (1924) XXXVII. 395; (1925) XXXVIII. 427; (1926) XXXIX. 399; (1927) XL. 393; (1928) XLI. 405; (1929) XLII. 401.		
PROPERTIES of milk, chemical and physiological, and their bearing on problems of the dairy industry, by J. B. Orr, D.S.O., M.C., M.A., M.D., D.Sc.	XXXVI.	40
PROPOSED cattle breeding conference. See under "Cattle."		
PROPOSED grassland conference. See under "Grassland."		
PROPOSED milk investigation. See under "Milk."		
PROPOSED National Dairy Council for Scotland. See under "National."		
PROPOSED quarantine station for Scotland. See under "Quarantine."		
PROPOSED Sheep (General Double Dipping) Order, 1925—		
Adoption of, not agreed to	XXXVIII.	438
Representatives appointed to a conference.	XXXVIII.	448
PUBLICATIONS—		
Payments to writers (1923) XXXVI. 373; (1924) XXXVII. 400; (1925) XXXVIII. 433; (1926) XXXIX. 404; (1927) XL. 400; (1928) XLI. 412; (1929) XLII. 408.		
Suggestion that size of 'Transactions' be reduced to, 404.	XL.	400; not acceded to, 404.

Q

QUARANTINE station for Scotland—

Representatives to attend conference with Board of Agriculture	XL.	398
Report of conference	XL.	400
Society to initiate movement and undertake management of.	XL.	400
Application to Empire Marketing Board	XL.	400
Committee appointed to look out for site	XL.	400, 404
Proposed site at Ibrox, Glasgow	XL.	407
Ministry of Agriculture consider site at Ibrox unsuitable	XL.	410
Committee to inspect further sites	XL.	410
Site adjacent to Princes Dock, Glasgow, recommended	XL.	415, 416
Further accommodation to be acquired adjoining Princes Dock	XLI.	407
Plans, &c., to be prepared	XLII.	407
Plans, &c., submitted	XLI.	409
Information to be obtained as to which colonies and dominions will accept stock through the station	XLI.	410
Operations suspended	XLI.	418
Option granted on site at Princes Dock, Glasgow	XLI.	418
Letter from Mr J. Duthie Webster as to proceeding with the station	XLII.	413
Society to await representations from Breed Societies	XLII.	413
Information regarding London station submitted	XLII.	416
Number of animals from Scotland passed through London station	XLII.	420
Reports to General Meetings	XL.	419; XLI. 437; XLII. 429

	Vol.	Page
QUEEN, H.M. The, telegram to, on illness of H.M. The King of, for message of sympathy, 427.	XLI.	442; thanks
QUEEN ALEXANDRA, H.M.—Address to H.M. The King on death of, 440; thanks of H.M. The King for the address, XXXVIII.	XXXVIII.	444.
R		
RAILWAY carriage on drain tiles—Society to support appeal to Railway Rates Tribunal	XL.	403
RAILWAY freights, reduction in— Representatives appointed to attend a conference	XLI.	411
Report of proceedings at conference	XLI.	418
RAINFALL records, in inches (1923) XXXVI. 246; (1924) XXXVII. 263; (1925) XXXVIII. 293; (1926) XXXIX. 233; (1927) XL. 237; (1928) XLI. 256; (1929) XLII. 246.		
RAPE, acreage in each county of Scotland (1923) XXXVI. 247; (1924) XXXVII. 264; (1925) XXXVIII. 284; (1926) XXXIX. 234; (1927) XL. 238; (1928) XLI. 257; (1929) XLII. 247.		
RATING and taxation of agricultural subjects in Scotland, by J. H. Milne Home, F.H.A.S.	XXXVII	93
RAYS, influence on nutrition of sunlight and artificially produced ultra-violet, by J. B. Orr, D.S.O., M.C., M.D., &c.; J. M. Henderson, M.A., M.B., D.Sc.; and Arthur Crichton, M.A., B.Sc.	XXXVIII.	88
REAPING machine, centenary of invention of— Suggestion that Society establish a "Dr Bell" agricultural scholarship	XXXIX.	414
Society not to issue appeal for funds	XXXIX.	414
REAPING machine, Patrick Bell and the centenary of the, by Professor James Hendrick, B.Sc., F.I.C.	XL.	51
RECORDS, milk. See "Milk."		
REGIONAL Survey of Edinburgh, Dr T. G. Nasmyth to represent Society on Committee	XXXIX.	408
REGULATIONS relating to sheep scab— Society not to concur with proposed Sheep (General Double Dipping) Order, 1925	XXXVIII.	438
Representatives appointed to a conference	XXXVIII.	448
See also "Sheep Scab."		
REID, Colonel John F., resolution on death of	XL.	396
REITH, Mr William, resolution on death of	XLI.	408
RELATION of the chemical composition of pasture to its feeding value, the, by J. B. Orr, D.S.O., M.C., M.D., M.B., D.Sc.	XLI.	99
REPRESENTATIVES of the Board on other bodies. See Appendix to each volume.		
REPRESENTATIVES of Scottish milk producing and distributing interests, conference of— Representatives appointed to attend	XXXVI.	383
RESEARCH, Departmental Committee on Agricultural Education and— Sir David Wilson and Mr George Will to give evidence before Report of evidence given	XXXVI.	394
	XXXVII.	398
RESEARCH in animal breeding. See "Animal."		
RESEARCH in animal nutrition. See "Rowett Research Institute."		

	Vol.	Page
RESEARCH in Scotland, agricultural, being a brief summary of the work at the Scottish Agricultural Research Stations—		
1927	XL.	146
1928	XLI.	178
1929	XLII.	169
RESIGNATION of director—		
Letter from General Sir Walter Charteris Ross of Cromarty	XXXVI.	381;
agrees to continue on Board, 385.		
Letter from Lieut.-Colonel T. W. Cuthbert	XLII.	406; resignation accepted, 408.
RESTRICTIONS on exportation of Scottish pedigree stock. See under "Exportation."		
REVIEW of recent work on the nutrition of the pig, by J. B. Orr, D.S.O., M.A., M.C., M.D., &c., and Arthur Crichton, M.A., B.Sc.	XXXIX.	25
REVISION of Society's bye-laws—Memorandum from law agents .	XLII.	417
REVOLUTION in Scotland, 1750-1810, the agricultural, by Professor J. A. Scott Watson	XLI.	1
RICHMOND and Gordon, the Duke of, K.G.—		
Elected President of the Society (1927-28)	XL.	417
Resolution on death of	XL.	411
ROBERTSON, Mr Alexander, resolution on death of	XLII.	401
RODGER, Mr James, resolution on death of	XLI.	424
ROSEBERRY, The Earl of, K.G., K.T., resolution on death of .	XLII.	407
ROSS, General Sir Walter Charteris, of Cromarty—		
Desires to resign from Board of Directors	XXXVI.	381
Agrees to continue on Board	XXXVI.	385
Resolution on death of	XL.	414
ROTATION, a soil balance sheet for a, by Professor James Hendrick, B.Sc., F.I.C.	XLII.	1
ROWETT Research Institute—		
Application for grant	XXXVI.	383
Application refused	XXXVI.	387
Application for grant towards cost of experimental stock farm .	XL.	415
Grant of £1000	XLI.	407; confirmed, 409, 436
ROXBURGHE, the Duke of, K.T., M.V.O., elected President of the Society (1925-26)	XXXVIII.	453
ROYAL Agricultural Society of England—Date fixed for Newport Show, 1927	XXIX.	399
ROYAL (Dick) Veterinary College—		
Grant of £250 to Centenary Celebration Fund	XXXVI.	383
Grant of £20 towards cost of investigation into dentition of the pig	XL.	404, 407; confirmed, 422
Grant of £50 towards cost of investigation into milk fever .	XLI.	419; confirmed, 423, 443.
Mr J. E. Kerr appointed trustee of Centenary Post-Graduate Fellowship	XLII.	421
ROYAL Northern Agricultural Society—		
Request for certain privileges to members of, during Aberdeen Show, 1928	XL.	404
Request not acceded to	XL.	406
ROYAL Scottish Arboricultural Society—Grants for Forestry Exhibition. See under the various Shows.		
RURAL Amenities Bill—Copy submitted	XLII.	424

	Vol.	Page
RURAL areas, electricity supply in—		
Report of a conference regarding	XLII.	409
Views of Society regarding findings of conference requested	XLII.	413
Representatives agree with notes of conference	XLII.	416
Draft bill to be circulated to bodies interested	XLII.	416
RURAL districts, telephone facilities in, Society to support move- ment for	XXXVII.	398
RURAL Institutes, Scottish Women's, grants to Federations of. See Appendix to each volume.		
RYE, acreage in each county of Scotland (1923) XXXVI. 247; (1924) XXXVII. 264; (1925) XXXVIII. 284; (1926) XXXIX. 234; (1927) XL. 238; (1928) XLI. 257; (1929) XLII. 247.		
S		
ST KILDA Fund—		
Flour and oatmeal supplied to islanders	XXXVI. 376; XL. 396; XLI. 409, 413; XLII. 405, 409.	
Tender accepted	XXXVI.	379
Request for new boat	XXXIX.	399
New boat to be purchased	XXXIX.	403
SALARIES—		
Mr John Stirton, Secretary—Salary increased	XXXVI.	389
Mr J. G. Yardley, third clerk—Salary increased	XXXVI.	389
Mr J. G. Yardley appointed chief clerk	XXXVIII.	439
Mr J. G. Yardley—Salary increased	XXXIX. 412; XL. 410; XLII. 414	
Mr J. G. Blake—Salary increased	XXXIX. 412; XL. 410	
Miss A. T. Maitland, typist—Salary increased	XXXIX. 412; XLII. 414	
SCAB, sheep, by Sir Stewart Stockman, M.R.C.V.S.	XXXVII.	1
SCAB, sheep, regulations relating to. See under "Sheep."		
SCHEME of cropping, winter forage crops and their place in a, by Professor W. G. R. Paterson, B.Sc., N.D.A.(Hons.)	XXXVIII.	106
SCIENCE Committee—		
Analyses for members—		
Privileges amended	XXXVII.	410
Special Committee to inquire into	XXXVIII.	432
Number of samples restricted	XXXVIII.	442
Question raised at General Meeting regarding fertilisers and water supplies	XL.	419
Animal breeding—		
Letter from Royal Agricultural Society of England	XXXVIII.	431
No grant to be given for experimental work on the breeding of pigs	XXXVIII.	431
Animal breeding problems—Letter from Animal Breeding Research Department, University of Edinburgh, regarding sterility of stock	XXXVI. 386, 388	
Arsenical sheep dips—		
Inclusion in Poisons and Pharmacy Act, 1908, considered to impose vexatious restrictions	XXXVIII.	431
Discolouration of wool—		
Letters from Skinners' Association	XXXVIII. 451; XXXIX. 401; XL. 409	
Deputation from Skinners' Association to be received	XL.	409
Report by Dr Tocher	XLI.	421
Dr Tocher to conduct investigation into bloom dips	XLI.	421
Feeding-stuff, no action taken with regard to complaint of price of	XXXVIII.	431
Fertilisers and Feeding-Stuffs Act, 1906—		
Sir David Wilson, Bart., to give evidence before Depart- mental Committee	XXXVI.	383
Mr John Speir to give evidence in place of Sir David Wilson, Bart.	XXXVI.	384
Information to be obtained from County Councils	XXXVI.	384

	Vol.	Page
SCIENCE Committee—continued		
Observations to be submitted to Advisory Committee	XXXVIII.	430
Report by Dr J. F. Tocher to General Meeting	XXXVII.	418-420
Foot and Mouth Disease—		
Spread of infection from second-hand sacks	XXXVI.	388, 390; XXXVII. 395.
Suggestion that monetary reward be offered by Society towards discovering immunity from	XXXVI.	391, 402
Monetary reward considered unnecessary	XXXVI.	393, 394; XXXVII. 418
Letter from Royal Dublin Society as to insinuations that outbreak traceable to Ireland	XXXVI.	392
Motion by Mr J. Lyon Guild at General Meeting	XXXVI.	402; amendment by Mr J. T. M'Laren, 402.
See also "Foot and Mouth" Disease.		
Glanders—Letter from Yorkshire Agricultural Society	XXXVI.	383, 388
Grassland conference—		
Letter from Nitram, Ltd.	XL.	409
Request that Society convene a conference	XL.	409
Recommended that subject be discussed by agricultural section of the British Association	XL.	409; XLI. 405
Grass sickness investigation—		
Account of whole investigation	XXXVI.	65
Final grant of £25 from Angus Agricultural Society	XXXVI.	378
Perthshire Agricultural Society not to contribute further	XXXVI.	378
Dr J. F. Tocher to prepare account of whole investigation	XXXVI.	386
Further investigation by Ministry of Agriculture, Animal Diseases Research Association, and others	XXXVI.	399, 404
Society not to contribute further	XXXVII.	404
Statement by Dr Tocher to General Meetings	XXXVI.	403; XXXVII. 420
Letter from Sir Stewart Stockman as to grants for	XXXVII.	405
Hannah Dairy Research Institute—Grant for three years not to be given	XLI.	421
Milk investigation—		
Proposal by Dr Tocher that Society give grant for a	XL.	409
Dr Tocher to prepare detailed scheme	XL.	409
Warble fly investigation. See "Warble Fly."		
Wild White Clover Seed—Representatives appointed to a meeting	XXXIX.	401
SCIENTIFIC farm management, by James Wyllie, B.Sc., N.D.A. (Hons.), N.D.D.		
	XXXVII.	104
SCIENTIFIC Societies, Conjoint Board of, dissolved		
	XXXVI.	373
SCONE, Lord, appointed representative to a conference regarding fire insurance of woods		
	XLII.	413
SCOTLAND, agricultural co-operation in, by T. G. Henderson		
	XLI.	71
SCOTLAND, agricultural research in, being a brief summary of the work at the Scottish Agricultural Research Stations (1927) XL. 146; (1928) XLI. 178; (1929) XLII. 169.		
SCOTLAND, Association for Preservation of Rural—		
Mr Athole S. Hay appointed representative on	XLI.	407
Subscription of two guineas to	XLI.	407
SCOTLAND, commercial pig production in, by Alexander Calder, Ph.D., B.Sc.		
	XLII.	118
SCOTLAND, proposed National Dairy Council for. See under "Dairy Council."		
SCOTLAND, proposed quarantine station for. See under "Quarantine."		
SCOTLAND, rating and taxation of agricultural subjects in, by J. H. Milne Home, F.H.A.S.		
	XXXVII.	93
SCOTLAND, the agricultural revolution in, 1750-1810, by Professor J. A. Scott Watson, B.Sc.		
	XLI.	1
SCOTT, Hon. Walter T. H. See "Polwarth."		

SCOTTISH Agricultural Organisation Society—

Conference as to supplies of home bacon in view of ban on continental imports	XXXIX. 405
Representatives appointed to the conference	XXXIX. 405
Grant of £100 (1927)	XXXIX. 412; confirmed, 414, 427
Grant of £100 (1928)	XL. 405; confirmed, 407, 422
Grant of £100 (1929)	XLI. 423; confirmed, 426, 443
Grant of £100 (1930)	XLII. 417; confirmed, 420, 433

SCOTTISH Championship Show, Society disclaim any connection with

XL. 243

SCOTTISH milk producing and distributing interests, conference of representatives—Representatives appointed to attend

XXXVI. 383

SCOTTISH National Milk and Health Association—

Grant of £100 (1925)	XXXVIII. 434; confirmed, 455
Application for grant for 1927	XL. 396
Grant of £100 (1927)	XL. 398; confirmed, 400, 418
Grant of £50 (1928)	XLI. 407; confirmed, 409, 436
Grant of £50 (1929)	XLII. 409; confirmed, 428
Representatives appointed on	XL. 396, 398; XLI. 407

SCOTTISH National Union of Allotment Holders—

Prizes from Society for allotment gardens	XXXIX. 414; XL. 395
Conditions of awards	XL. 397
See also Appendix.	

SCOTTISH pedigree stock, restrictions on exportation of—

Representation to be made to colonies	XXXVIII. 438
Letters from colonies	XXXVIII. 443
Report of deputation's negotiations with colonies	XXXVIII. 445
Canadian Government not to take risk of Scottish importations	XXXVIII. 447
Direct shipment of Scottish stock to Australia	XXXIX. 399, 401; XL. 393; XLI. 434.

SCOTTISH Society for Prevention of Cruelty to Animals, grants to. See under "Grants."

SCOTTISH soils, some characters of, by Professor James Hendrick, B.Sc., F.I.C.

XXXVII. 71

SCOTTISH Timber, &c., Exhibits Committee—

Grant of £50 towards cost of exhibit at British Empire Exhibition	XXXVI. 384
---	------------

SCOTTISH Women's Rural Institutes—Grants to Federations. See Appendix to each volume.

SEASON, feeding *versus* manuring for beef production during the grazing, by Professor Principal W. G. R. Paterson, B.Sc., N.D.A.(Hons.)

XXXIX. 60

SECOND clerk—

Death of Mr R. C. Todd	XLI. 413
Mr John Watt appointed	XLI. 433

SECRETARY, Mr John Stirton—Salary increased

XXXVI. 389

SECRETARY, honorary—

Death of Mr Charles Douglas, C.B., D.Sc.	XXXVI. 389
Sir Hugh Shaw Stewart, Bart., C.B., nominated as	XXXVII. 398; elected, 417; resigns office, XLI. 415.
Colonel F. J. Carruthers of Dormont nominated as	XLI. 420; elected, 442

SEED, wild white clover—

Letter from Ministry of Agriculture	XXXVIII. 451
Representatives appointed to discuss formation of a Growers' Association	XXXIX. 401
Report of representatives	XXXIX. 404
Members invited to send samples to Board of Agriculture	XXXIX. 401
Growing tests available in 1927	XXXIX. 411
Investigation of samples	XL. 401

	Vol.	Page
SETTLEMENT in Scotland, Committee on Land—		
Representatives appointed to give evidence before . . .	XL.	401
SHEEP—		
Number of, in each county of Scotland (1923) XXXVI. 252; (1924) XXXVII. 269; (1925) XXXVIII. 290; (1926) XXXIX. 240; (1927) XL. 244; (1928) XLI. 264; (1929) XLII. 254.		
Number and value of, imported into Great Britain from Ireland (1923) XXXVI. 258; (1924) XXXVII. 275; (1925) XXXVIII. 296; (1926) XXXIX. 246; (1927) XL. 250; (1928) XLI. 270; (1929) XLII. 260.		
Number and value of, imported into United Kingdom (1923) XXXVI. 258; (1924) XXXVII. 275; (1925) XXXVIII. 296; (1926) XXXIX. 246; (1927) XL. 250; (1928) XLI. 270; (1929) XLII. 260.		
Prices of, since 1818 (1923) XXXVI. 260; (1924) XXXVII. 277; (1925) XXXVIII. 298; (1926) XXXIX. 248; (1927) XL. 252; (1928) XLI. 272; (1929) XLII. 262.		
SHEEP, Cheviot, south and north country, by John Robson, Jun.	XLII.	63
SHEEP dips, arsenical—		
Resolution regarding inclusion of, under the Schedule to the Poisons and Pharmacy Acts of 1908 . . .	XXXVIII.	431, 434
Report of conference with Board of Agriculture . . .	XXXIX.	410
SHEEP scab, by Sir Stewart Stockman, M.R.C.V.S.	XXXVII.	1
SHEEP scab, regulations relating to—		
Society not to concur with adoption of proposed Sheep Scab (General Double Dipping) Order of 1925 . . .	XXXVIII.	438
Representatives appointed to attend a conference regarding . . .	XXXVIII.	448
Communications regarding control and eradication of . . .	XLII.	406
Special Committee appointed to consider matter . . .	XLII.	406
Report of Special Committee . . .	XLII.	408
Representatives appointed to act in conjunction with other bodies . . .	XLII.	408
SHEEP worrying by dogs—		
Communication regarding . . .	XL.	403
Society to support resolutions adopted by Blackface Sheep Breeders' Association . . .	XL.	407
Considered desirable that non-working dogs wear collars . . .	XL.	407
Report of conference on . . .	XLI.	418
SHIELDS, Mr G. B.—		
Appointed as representative on Convening Committee of Cattle Breeding Conference . . .	XXXVI.	392
Agrees to attend first meeting, but declines to act on Convening Committee . . .	XXXVI.	394
Reports proceedings at first meeting . . .	XXXVII.	396
Appointed as representative at a meeting regarding warble fly . . .	XXXVIII.	433
Appointed a representative to discuss formation of Wild White Clover Seed Growers' Association . . .	XXXIX.	401
Appointed representative to a conference on home bacon supplies . . .	XXXIX.	405
SHIRE horses—		
Classes instituted for, at Aberdeen Show, 1928 . . .	XL.	408, 411
Protest against offer of prizes for produce of stallions . . .	XLI.	410
Request for class for stallions not entertained . . .	XLII.	415
See also under "Aberdeen," "Alloa" and "Dumfries" Shows.		
SHOW and Exhibition, Swedish Agricultural—		
Representatives at . . .	XXXVI.	375
Directors to attend . . .	XXXVI.	377
SHOW of 1925 to be held in Glasgow	XXXVI.	374
See also "Glasgow Show."		

	Vol.	Page
SHOW of 1926—		
Fixed to be held in Border Division	XXXVI.	389
Sites Committee appointed	XXXVI.	389
Town of Berwick-on-Tweed offer site	XXXVI.	389
Report of Sites Committee	XXXVII.	400
Peebles fixed as site for Show	XXXVII.	404
£1000 offered by town of Peebles	XXXVII.	404
Letter from railway company regarding accommodation at Kelso	XXXVII.	424
Report to General Meeting (Jan. 1925) not adopted	XXXVII.	425
Site to be reconsidered	XXXVII.	412
Railway company prepared to build loading bank at Kelso	XXXVII.	415
Proprietor of site at Peebles withdraws offer	XXXVII.	415
Notice of motion to rescind decision that Show be held at Peebles	XXXVII.	415
Decision to hold Show at Peebles rescinded	XXXVIII.	428
Show to be held at Kelso	XXXVIII.	429
Reports to General Meeting (Jan. 1924)	XXXVI. 401; (June 1924) XXXVII. 417; (Jan. 1925) 423.	
See also "Kelso Show."		
SHOW of 1927—		
To be held in Edinburgh Division	XXXVII.	410, 425
Sites Committee appointed	XXXVII.	412
Meadows offered as a site	XXXVIII.	438
Notice that clause regarding Meadows in Edinburgh Provisional Order may be withdrawn	XXXVIII.	449
Statement as to Society's position in the matter	XXXVIII.	449
Statement to be sent to Edinburgh Town Council and the Press	XXXVIII.	449
Resolution to hold Show in Edinburgh to be rescinded if clause in Provisional Order be deleted	XXXVIII.	450
Meadows as a site not accepted	XXXVIII.	452
Application for use of Saughton Park	XXXVIII. 452; accepted, XXXIX. 400.	
See also "Edinburgh Show."		
SHOW of 1928—		
To be held in Aberdeen Division	XXXVIII.	446
Sites Committee appointed	XXXVIII. 452; report of, XXXIX. 413	
See also "Aberdeen Show."		
SHOW of 1929—		
To be held in Stirling Division	XXXIX.	415
Special Committee appointed to interview Town Council of Stirling, &c.	XXXIX.	418
King's Park, Stirling, not sufficient in extent	XL. 398, 410	
Sites Committee appointed	XL.	398
Railway facilities at Bridge of Allan not adequate	XL.	410
Report of Sites Committee	XLI.	406
Show to be held at Alloa	XLI.	406
Reports to General Meetings (Jan. 1927)	XXXIX. 427; (June 1927) XL. 418; (Jan. 1928) 423.	
See also "Alloa Show."		
SHOW of 1930—		
To be held in Dumfries Division	XL.	410
Special Committee appointed to interview owners of site of 1922	XLI.	410
Report of Special Committee	XLI.	412
Sites Committee appointed	XLI.	426
Invitation to hold Show at Dundee	XLI. 408, 426	
Reports to General Meetings (Jan. 1928)	XL. 423; (June 1928) XLI. 436	
See also "Dumfries Show."		
SHOW of 1931. See "Hundredth Show."		
SHOW of 1932—		
To be held in Inverness Division	XLII.	421
Committee appointed to inspect site	XLII.	423
Report to General Meeting	(Jan. 1930) XLII. 434	

	Vol.	Page
SHOW, Scottish Championship, Society disclaims any connection with	XLI.	423
SHOW treasurer, auditor and. See "Auditor."		
SHOWS, circuit of—		
Committee appointed to go into question of	XXXIX.	409
Report of Committee	XXXIX.	412
Amendment by Mr Alexander Munro defeated	XXXIX.	412
SHOWS, General. See "General."		
SICKNESS in horses, grass, by Dr J. F. Tocher	XXXVI.	65
SICKNESS investigation, grass. See "Grass."		
SINGLE judging—		
Captain John MacGillivray gives notice of motion regarding	XXXIX.	402
Motion submitted and approved	XXXIX.	404
Special Committee appointed	XXXIX.	404
Report of Special Committee	XXXIX.	409, 414
Selection Committee appointed	XXXIX.	409
Draft regulations submitted and approved	XXXIX.	417
Suggestion to discontinue sending out nomination forms not approved	XXXIX.	417
Requests to discontinue, not acceded to	XLI, 417, 434,	441
Two judges, acting independently, to be appointed for large classes	XLI.	417
SMALL holdings, by Arthur G. Ruston, B.A., B.Sc.(Lond.), D.Sc. (Leeds)	XXXVIII.	28
SMALL landowner, utilisation and conversion of timber from the point of view of the, by J. H. Milne Home. F.H.A.S.	XL.	23.
SMITH, Mr E. Hedley, resolution on death of	XXXVII.	402
SMITH, Mr J. R. C.—		
Nominated as an extraordinary director in room of Mr James Grieve (deceased)	XXXVIII.	436; elected, 457
SOCIETY, Geological, of London, to resume publication of 6 inch Ordnance Survey maps	XXXVII.	413
SOCIETY's chambers. See "Premises."		
SOIL balance sheet for a rotation, a, by Professor James Hendrick, B.Sc., F.I.C.	XLII.	1
SOIL fertility, some points about, by Professor James Hendrick, B.Sc., F.I.C.	XXXVIII.	195
SOILS, some characters of Scottish, by Professor James Hendrick, B.Sc., F.I.C.	XXXVII.	71
SOME grass land problems, by Professor J. A. Scott Watson, B.Sc.	XXXVI.	25
SOME hay and pasture experiments, by Principal W. G. R. Pater-son, B.Sc., N.D.A.(Hons.)	XL.	40
SOME popular fallacies in farming economics, by James Wyllie, B.Sc., N.D.A.(Hons.), N.D.D.	XXXIX.	1
SOME problems in farm management, by James Wyllie, B.Sc., N.D.A.(Hons.), N.D.D.	XLI.	21
SOUTH African farmers—		
Visit to Edinburgh Show, 1927	XL.	394
Dinner to	XL.	395, 399

	Vol.	Page
SPEIR, Mr John—		
Nominated to attend conference of representatives of Scottish milk-producing and distributing interests	XXXVI.	383
Appointed to give evidence before Departmental Committee on Fertilisers and Feeding-Stuffs Act, 1906	XXXVI.	384
Appointed to attend conference regarding National Dairy Council for Scotland, and on Provisional Council	XXXVII.	397, 404
Appointed representative to a conference regarding International Dairy Congress	XXXVII.	408
STACK, artificial drying of crops in the, by Professor James Hendrick, B.Sc., F.I.C.	XXXVI.	141
STACK-JUDGING Competition in Aberdeenshire—		
Application for medals	XXXVIII.	443
For grant of medals, see Appendix to Volumes XXXIX., XL., XLI., and XLII.		
STANDARD tables of unexhausted values of feeding-stuffs and fertilisers, proposed—		
Mr J. T. M'Laren appointed to attend conference	XXXVII.	410
Report of conference	XXXVII.	412
STANDARDS, feeding, by Professor J. A. Scott Watson, B.Sc.	XL.	1
STANFIELD, Professor R., consulting engineer, salary increased	XLII.	409
STATION, Pirbright cattle breeding, closing of	XXXVI.	375, 388
STATION, Scotland, Quarantine. See "Quarantine."		
STATISTICS, agricultural. See "Agricultural."		
STEWART, Sir Hugh Shaw, Bart., C.B.—		
Appointed delegate to World's Dairy Congress	XL.	416
Appointed to attend conference regarding proposed National Dairy Council for Scotland	XXXVII.	397, 404
Nominated for office of honorary secretary	XXXVII.	398; elected, 417; resigns office, XLI. 415; acknowledges excerpt minute, 424.
STEWART, Mr John, of Struthers—		
Appointed representative on deputation to Home Secretary regarding "Summer Time"	XXXVI.	394; report of meeting, XXXVII. 396.
STEWART, Sir Mark J. M'Taggart, resolution on death of	XXXVI.	380
STEWART-CLARK, Sir John, of Dundas, Bart., resolution on death of	XXXVI.	393
STIRLING, Captain John—		
Appointed representative on a committee on development of home pig production	XXXIX.	406
STIRLING, Show of 1929 not to be held at	XLI.	406
STIRLING, Brig.-General Archibald, appointed representative to a conference regarding fire insurance of woods	XLII.	413
STIRTON, Mr John, Secretary—Salary increased	XXXVI.	389
STOCK Breeders, Joint-Committee of British Live—		
Grant of ten guineas and annual affiliation fee	XLI.	419
STOCK, exportation of Scottish pedigree. See "Exportation."		
STOCK feeding, potatoes in, by J. K. Thompson, N.D.A.	XLII.	128
STOCK Judging Competition, Live—		
Regulations for	XXXIX.	417
Additional regulations	XXXIX.	419
Regulations revised	XL.	412
STOCKS of crop plants, choice of varieties of, by Professor J. A. Scott Watson, B.Sc.	XXXVII.	55

	Vol.	Page
STORE cattle, compulsory weighing of—		
Letter from the Morayshire Farmers' Club regarding compulsory weighing at auction marts, remitted to Special Committee	XXXVII.	404
Additional members added to Committee	XXXVII.	410
Committee's recommendations not adopted	XXXVII.	412
STRATHKERN Agricultural Society—Complaint regarding holding a Show in 1929		
	XLII.	408
STRIKE, General—Acceptance of entries for Kelso Show		
	XXXIX.	402
STUDS on traction engine wheels—		
Colonel F. J. Carruthers attends conference on	XXXVII.	407
Report of conference	XXXVII.	407
SUCCESSFUL poultry farming, fourteen years', by Arthur G. Ruston, B.A., B.Sc.(Lond.), D.Sc.(Leeds), and C. V. Dawe, M.Com.		
	XL.	70
SUGAR-BEET, acreage in each county of Scotland (1927) XL. 238; (1928) XLI. 257; (1929) XLII. 247.		
SUGAR-BEET cultivation, by William Bruce, M.A., B.Sc.		
	XL.	92
SUGAR-BEET industry—To receive attention in 'Transactions'		
	XXXVIII.	459
SUMMER time—		
Mr Thomas Kirk appointed on deputation to Home Secretary	XXXVI.	386
Mr Kirk unable to attend with deputation	XXXVI.	394
Further representatives on deputation	XXXVI.	394
Report of meeting of joint deputation with Home Secretary	XXXVII.	396
SUNLIGHT and artificially produced ultra-violet rays, influence on nutrition of, by J. B. Orr, D.S.O., M.C., M.D., &c.; J. M. Henderson, M.A., M.B., D.Sc.; and Arthur Crichton, M.A., B.Sc.		
	XXXVIII.	88
SUPERPHOSPHATES, import duty on, proposal regarding, to be opposed		
	XXXVIII.	430
SURVEY of Edinburgh, Regional, Dr T. G. Nasmyth appointed representative on Committee		
	XXXIX.	408
SUSCEPTIBILITY to disease, the influence of diet on, by J. B. Orr, D.S.O., M.C., M.A., M.D., D.Sc.		
	XLII.	28
SWEDES. See "Turnips."		
SWEDISH Agricultural Show and Exhibition—		
Representation at	XXXVI.	375
Directors to attend	XXXVI.	377

T

TABLES of unexhausted values of feeding-stuffs and fertilisers, proposed standard—		
Mr J. T. M'Laren appointed to attend conference	XXXVII.	410; report of conference, 412.
TAMWORTH pigs—Importation of, from Canada		
	XXXIX.	402
TAX, Entertainment, no action taken as to request that Society call a conference regarding		
	XXXVIII.	429
Letter from East Lothian Agricultural Society	XXXVIII.	446
TAXATION and rating of agricultural subjects in Scotland, by J. H. Milne Home, F.H.A.S.		
	XXXVII.	93
TAYLOR, J. P. Ross—		
Appointed representative on Wool Breeding Council for Great Britain	XXXVIII.	439; XXXIX. 413
Nominated as an ordinary director in room of Mr Gilbert Davidson (deceased)	XL.	406; elected, 422.
Appointed to attend meeting regarding railway freights	XLI.	411; report of meeting, 418.

	Vol.	Page
TELEPHONE facilities in rural areas, Society to support Duchess of Atholl, M.P., in her appeal for	XXXVII.	398
TIMBER, &c., Exhibition Committee, Scottish—Grant of £50 towards cost of exhibit at British Empire Exhibition	XXXVI.	384
TIMBER, home—		
Question regarding supply for Showyard	XXXIX.	417
Tenders for, to receive preference	XXXIX.	420
Suggestion that 75 per cent of, be used for Showyard	XLI.	428
No action taken	XLII.	422
TIMBER, utilisation and conversion of, from the point of view of the small landowner, by J. H. Milne Home, F.H.A.S.	XL.	23
TOCHER, Dr J. F.—		
To prepare an account of whole investigation into "Grass Sickness" in horses	XXXVI.	366
Statements regarding "Grass Sickness" investigation	XXXVI.	403 ; XXXVII. 420.
Report to General Meeting as to Fertilisers and Feeding-Stuffs Act, 1926	XXXVII.	418-420
Requests grant for a milk investigation	XL.	409
To conduct an investigation into bloom dips	XLI.	421
TODD, Mr R. C., second clerk, resolution on death of	XLI.	413
TRACTION engine wheels, studs on—		
Colonel F. J. Carruthers attends a conference	XXXVII.	407
Report of conference	XXXVII.	407
TRACTOR, electric—		
Proposal by Mr Andrew M'Dowall that Society offer £5000 for effective method of reducing costs of cultivation recommended to Special Committee	XXXVI. 391, 394 ; XXXVII. 410.	proposal not entertained,
Request that Society apply for grant of £3000 from Development Commission	XLI. 418 ;	refused, 425
TRADE Boards (Milk Distributive) Orders—Copy of notice submitted	XLI.	405
TRANSACTIONS. See "Publications."		
TRANSPORT Bill—Society to support inclusion of a clause regarding spark arresters	XLII.	420
TUBERCULIN test—Suggestion regarding cattle sent to Argentine not adopted	XXXVII.	405
TULLY, Mr A. B., M.R.C.V.S., appointed veterinary inspector for Kelso Show, 1926	XXXVIII.	445
TURNBULL, Mr P. O.—		
Declines Convenership of Implements Committee	XL.	407
Reports on conferences as to inspection of growing crops of potatoes	XXXVII. 400 ; XLII.	413
To attend conference regarding importation of German oats	XLII.	416
To attend conference regarding agricultural depression	XLII.	426
TURNIP topping and tailing machines—		
Suggested trial of, and grant of medals for	XL.	415
Trial not to be held	XLI.	409
TURNIPS—		
Acreage in each county of Scotland (1923) XXXVI. 247 ; (1924) XXXVII. 264 ; (1925) XXXVIII. 284 ; (1926) XXXIX. 234 ; (1927) XL. 238 ; (1928) XLI. 257 ; (1929) XLII. 247.		
Total produce, acreage, and average yield per acre in each county in Scotland (1923) XXXVI. 250 ; (1923) XXXVII. 267 ; (1924) XXXVIII. 287 ; (1925) XXXIX. 237 ; (1926) XL. 241 ; (1927 and 1928) XLI. 261 ; (1929) XLII. 251.		

U

- Vol. Page
- ULTRA-VIOLET rays, influence on nutrition of sunlight and artificially produced, by J. B. Orr, D.S.O., M.C., M.D., &c.; J. M. Henderson, M.A., M.B., D.Sc.; and Arthur Crichton, M.A., B.Sc. XXXVIII. 88
- UNEKHAUSTED values of manures and feeding-stuffs. See Appendix to each volume.
- UNEKHAUSTED values of feeding-stuffs and fertilisers, proposed standard tables of—
Mr J. T. M'Laren appointed to attend conference XXXVII. 410; report of conference, 412.
- UNITE, John, Ltd.—
Grant of £250 towards cost of damage to canvas destroyed at Edinburgh Show XL. 410
- UNITS to be used in determining the commercial value of manures. See Appendix to each volume.
- UNIVERSITY of Edinburgh—
Application for grant towards endowment of a Department of Research in Animal Breeding XXXIX. 418
Grant of £1000 XXXIX. 420; confirmed, XL. 395, 418
- UTILISATION and conversion of timber from the point of view of the small landowner, by J. H. Milne Home, F.H.A.S. XL. 23

V

- VACANCIES on Board. See "Directors."
- VALUES of feeding-stuffs and fertilisers, proposed standard tables of unexhausted—
Mr J. T. M'Laren appointed to attend conference XXXVII. 410
Report on conference XXXVII. 412
- VALUES, tables of compensation. See Appendix to each volume.
- VARIETIES and stocks of crop plants, choice of, by Professor J. A. Scott Watson, B.Sc. XXXVII. 55
- VETCHES, acreage in each county in Scotland (1923) XXXVI. 247; (1924) XXXVII. 264; (1925) XXXVIII. 284; (1926) XXXIX. 234; (1927) XL. 238; (1928) XLI. 257; (1929) XLII. 247.
- VETERINARY Congress, 11th International, representatives appointed to attend XLII. 413
- VETERINARY department—
Institution of. See Appendix to each volume.
Medals to students (1923) XXXVI. 361; (1924) XXXVII. 383; (1925) XXXVIII. 415; (1926) XXXIX. 387; (1927) XL. 381; (1928) XLI. 392; (1929) XLII. 389.

W

- WALES, H.R.H. The Prince of—
Requested to accept election as an honorary member XXXIX. 402
Accedes to request XXXIX. 403
Elected as honorary member XXXIX. 421
To visit Kelso Show XXXVIII. 458; XXXIX. 403, 424; thanks to, 408
- WALLACE, Mr Duncan M., resolution on death of XL. 399
- WALLACE, Mr Falconer L.—
Appointed representative on deputation to Home Secretary regarding summer time XXXVI. 394; reports results of deputation, XXXVII. 396.
Statement regarding "Grass Sickness" in horses XXXVI. 399, 404
Statement regarding finances of the Society XXXVI. 400
Appointed Convener of Local Committee, Aberdeen Show, 1928 XL. 406
Raises question as to single judging XLI. 441

	Vol.	Page
WARBLE flies of cattle, the, by R. Stewart MacDougall, M.A., D.Sc., F.R.S.E.	XLII.	75
WARBLE fly—		
Report by Dr R. Stewart MacDougall	XXXVI.	397
Representative appointed to attend joint meeting of farmers, butchers, and leather merchants	XXXVIII.	433
WARBLE fly investigation—		
Letter from Leathersellers' Company	XLII.	410
Report by Colonel F. J. Carruthers of meeting with Leather- sellers' Company	XLII.	410
Colonel Carruthers to represent Society on Leathersellers' Committee	XLII.	410
Statement by Colonel Carruthers regarding order of procedure	XLII.	413
Further report regarding meeting of Leathersellers' Company	XLII.	418
Society to initiate investigation in Scotland	XLII.	418
Remitted to Science Committee	XLII.	419
Grant of £500 to meet cost of experiments in Scotland	XLII.	422
Sub-Committee appointed	XLII.	422
Report of arrangements for demonstration areas and for commencement of investigation	XLII.	426
WARR , the Very Rev. Charles Lang, M.A.—		
Appointed chaplain to the Society	XXXIX.	414
Accepts office	XXXIX.	416
Appointment confirmed	XXXIX.	426
WART disease in potatoes, report of conference regarding	XXXVI.	379
WATER supplies—Question regarding raised at General Meeting	XL.	419
WATT , Mr John, appointed second clerk	XLI.	433
WEATHER in Scotland—		
By Andrew Watt, M.A., F.R.S.E. (1923) XXXVI. 238; (1924) XXXVII. 254; (1925) XXXVIII. 275; (1926) XXXIX. 224; (1927) XL. 228.		
By A. H. R. Goldie, M.A., F.R.S.E. (1928) XLI. 249		
By J. Crichton, M.A., B.Sc. (1929) XLII. 237		
WEBSTER , Malcolm Wallace Graham, appointed beneficiary of Argyll Naval Fund	XXXVIII.	448
WEIGHING of store cattle—		
Letter from Morayshire Farmer Club as to compulsory weigh- ing at auction marts	XXXVII.	404
Remitted to Special Committee	XXXVII.	404
Additional members added to Committee	XXXVII.	410
Committee's recommendation not adopted	XXXVII.	412
WEMYSS and March, The Earl of—		
Elected President of the Society for year 1926-27	XXXIX.	421
WEST of Scotland Agricultural College—Application for grant in aid of building and equipment fund	XLII.	420
WHEAT , acreage in each county in Scotland (1923) XXXVI. 247; (1924) XXXVII. 264; (1925) XXXVIII. 284; (1926) XXXIX. 234; (1927) XL. 238; (1928) XLI. 257; (1929) XLII. 247.		
Price of home-grown in the Edinburgh Market (1923) XXXVI. 259; (1924) XXXVII. 276; (1925) XXXVIII. 297; (1926) XXXIX. 247 (1927) XL. 251; (1928) XLI. 271; (1929) XLII. 261		
Total produce, acreage, and average yield per acre in each county in Scotland (1922) XXXVI. 248; (1923) XXXVII. 265; (1924) XXXVIII. 285; (1925) XXXIX. 235; (1926) XL. 239; (1927 and 1928) XLI. 258; (1929) XLII. 248.		
WHEAT bulb fly—Report by Dr R. Stewart MacDougall	XXXVI.	397
WHEAT experts—		
International conference of, at Rome	XL.	393

	Vol.	Page
WATTE, Mr Archibald, to attend conference regarding damage by deer	XLII.	411, 423
WILD white clover seed—		
Letter from Ministry of Agriculture	XXXVIII.	451
Representatives to discuss formation of a Growers' Association	XXXIX.	401
Report of representation	XXXIX.	404
Members of Society invited to send samples to Board of Agriculture	XXXIX.	401
Growing tests to be available in 1927	XXXIX.	411
Investigation of samples	XL.	401
WILL, Mr George—		
To give evidence before Departmental Committee on Agricultural Education and Research XXXVI. 394; evidence given, XXXVII. 398.		
Appointed to attend conference regarding proposed National Dairy Council for Scotland	XXXVII.	397
WILLIAMSON, the Very Rev. Dr Wallace, chaplain to the Society—		
Congratulations to, on receiving the Order of K.C.V.O.	XXXVIII.	450
Resolution on death of	XXXIX.	407
WILSON, Sir David, Bart., D.Sc.—		
To give evidence before Departmental Committee on Fertilisers and Feeding-Staffs Act, 1908	XXXVI.	383
To give evidence before Departmental Committee on Agricultural Education and Research XXXVI. 394; evidence given, XXXVII. 398.		
Appointed representative to a conference regarding proposed National Dairy Council for Scotland	XXXVII.	397
Appointed delegate to World's Dairy Congress	XL.	416
WINTER forage crops and their place in a scheme of cropping, by Professor W. G. R. Paterson, B.Sc., N.D.A.(Hons.)	XXXVIII.	106
WOODS, fire insurance of—Representatives to attend a conference regarding	XLII.	413
WOOL—		
Average prices of (1923) XXXVI. 253; (1924) XXXVII. 270; (1925) XXXVIII. 291; (1926) XXXIX. 241; (1927) XL. 245; (1928) XLI. 265; (1929) XLII. 255.		
Prices of since 1818 XXXVI. 263; XXXVII. 280; XXXVIII. 301; XXXIX. 251; XL. 255; XLI. 276; XLII. 266.		
WOOL Breeding Council for Great Britain—		
Mr J. P. Ross Taylor appointed representative on	XXXVIII.	439
Appointment confirmed	XXXIX.	413
WOOL, discolouration of—		
Letter from Skinners' Association	XXXVIII.	451
Further information to be obtained	XXXIX.	401
Deputation from Skinners' Association to be received	XL.	409
Report by Dr J. F. Tocher	XLI.	421
Dr J. F. Tocher to conduct an investigation into bloom dips	XLI.	421
WOOL Federation, British—		
Statement regarding serious decline in wool production	XXXVII.	400
WORLD'S Dairy Congress—		
Mr W. P. Gilmour appointed as representative to attend meeting regarding	XL.	393
Draft programme submitted	XL.	413
Request for contribution	XL.	413
Grant of twenty-five guineas	XL.	416
Delegates appointed to congress	XL.	416
See also "International Dairy Congress."		
WOMEN'S Rural Institutes, Federations of Scottish. For grants to, see Appendix to each volume.		

Y

	Vol.	Page
YARDLEY, Mr J. G.—		
Salary increased	XXXVI.	389
Appointed chief clerk	XXXVIII.	439
Salary increased	XXXIX. 412; XL. 410; XLII.	414
YORKSHIRE Agricultural Society—		
Letter from, regarding glanders remitted to Science Committee	XXXVI.	383
Report of Science Committee	XXXVI.	388
YOUNG, Mr Robert C., resolution on death of	XL.	414
YOUNGER, Viscount, of Leckie, resolution on death of	XLII.	405

Z

ZOOLOGICAL Department—Report to General Meeting	XXXVI.	397
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